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OPPORTUNITIES FOR

COW-CALF Operations

IN NEBRASKA

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A PROSPECTUS

Extension Service
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U. S. Department of Agriculture and the College of Home Economics
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OPPORTUNITIES FOR COW-CALF OPERATIONS IN NEBRASKA

- A Prospectus -

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FOREWORD

The purpose of this report is to discuss the following major areas:

- The present status and characteristics of Nebraska's beef cow-calf industry;
- Evaluation of some resources important to the beef cow-calf industry in Nebraska;
- Economic considerations involved in operation of Nebraska's beef cow-calf herds; and
- Certain factors to consider in future beef cow-calf production in Nebraska.

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SECTION I

NEBRASKA'S BEEF COW-CALF INDUSTRY

Present Status -

Robert M. Koch

Nebraska is a great livestock state. It is a great beef producing state. Nebraska can attribute much of its livestock capability to a fortunate combination of water, forage, feed grains, and geographic location.

Nebraska is blessed with the largest underground water supply of any state. This means water for cattle from streams, reservoirs or wells; water to sub-irrigate alfalfa and wild hay meadows; water to irrigate corn and sorghum, providing stability to feed production in times of drouth and opportunity for expansion of feed supplies as needed.

Of the estimated 48 million acres of farm and ranch land in Nebraska, about 50% is native grasslands. These native grasslands, which include the famous Sandhills of Nebraska, are a natural setting for beef cattle production and provide efficient natural factories for converting grass, forage and feed grains into delicious beef for human consumption. Feed grain production (mainly corn and sorghum) increased tremendously since 1950 as new technology and irrigation were applied. Nebraska now has a surplus of feed grains capable of feeding about twice as many livestock as are currently grown out in the state. Increased feed grain production with its associated crop residues and release of marginal acres for pasture has stimulated interest in cow herd expansion in the traditional farming areas of the state. Nebraska's cowboys are becoming more uniformly spread over the state.

Nebraska's location on the western edge of the Corn Belt will continue to be an asset. The state's feed grain supplies are in close proximity to the supply of feeder cattle in western Nebraska and adjacent states which produce a surplus of feeder cattle. The proximity to the Corn Belt provides an active demand for feeder cattle produced in the state. Current trends suggest an increasing demand for feeder cattle within the state as well as in other cattle feeding states. Nebraska's central location provides easy access to ship east or west from its packing plants. As the center of population moves westward, this competitive location will be a plus factor for Nebraska's beef industry.

Cattlemen and cattle producing areas make their reputation by the performance of their cattle. Progressive cattle producers and feeders are constantly evaluating and comparing performance of cattle to determine how well they fulfill the basic function as a beef factory. Nebraska cattlemen have built an enviable reputation as producers of beef cattle with top performance. Superior performance of beef cattle is achieved through improved breeding, coupled with good feeding, health and management practices. For the cow-calf man, breeding is of primary importance in developing superior feeder cattle. Possibilities for improving productivity of cattle through breeding have never been greater. New breeding facts are rapidly becoming available from research at state agricultural experiment stations and the U.S. Department of Agriculture. These research studies indicate significant advances can be made in such traits as weaning weight, feedlot gain, efficiency of feed use, conformation, muscling and distribution of fat in the carcass. The increased "built in" production will enable producers to market cattle at younger ages or at heavier weights and still have the desired market weight and grade. Research resources available to Nebraska cattlemen are excellent. Information from sister state experiment stations is readily available through the Cooperative State Research Service and the Cooperative Extension Service. The Nebraska Agricultural Experiment Station has an active livestock research program going on at six locations throughout the state. A rapidly expanding source of livestock research information is the new U.S. Meat Animal Research Center at Clay Center, Nebraska. The University of Nebraska actively cooperates with U.S. MARC.

A resource of great importance to past achievements and for future growth in beef cattle production is the "cattle savvy" and competitive spirit that is the heritage from hardy and independent pioneers who settled Nebraska. Proper combinations of man, land, feed and capital can enable beef production to continue as a major contributor to Nebraska's economy.

SECTION I

NEBRASKA'S BEEF COW-CALF INDUSTRY

Characteristics, Structure, Trends, and Geographic Distribution -

John K. Ward

Beef consumption trends during the 1950's and 1960's in the United States created a demand for more and better beef. Feedlot operators have responded by increasing capacity and numbers fed. The cow-calf industry in the state of Nebraska has during this time undergone moderate expansion, but has not kept pace with the demand for feeder cattle in Nebraska feedlots. With Nebraska ranking first in numbers of beef cattle slaughtered, third in cattle fed, and fourth in beef cow-calf numbers, it seems evident that Nebraska feeders are buying feeder cattle increasingly on an out-of-state basis.

Recent trends in Nebraska beef cow numbers are shown in Figure 1. National trends in beef cow numbers, as shown in Figure 2 and Table 1, indicate that the rate of growth of the cow-calf industry in the state of Nebraska has not kept pace with national increases during the past decade. The national increase for the 1960's was over 40%, while Nebraska's increase was about 25%.

Characteristics of Nebraska Cow Herds

As indicated in Figure 3, the increase of almost 400,000 head of beef cows was spread over the entire state; however, the percentage increase was most rapid in the eastern 1/3 of the state. The western 2/3 of the state, although increasing beef cow numbers, did so at a much slower rate.

Several factors are involved in increased beef cow numbers in eastern Nebraska. The seeding of marginal farmland back to grass accounts for increased grazing in the so-called farming areas of the state. Interest on the part of crop producers in better utilization of crop refuse may also account for part of the interest in cow herds and increased beef cow numbers in the farming area. In Figure 4 the correlation between acres planted to corn and the increase in beef cow numbers during the decade of 1961-71 is obvious.

Table 1. Cattle on Farms in the United States, 1955 - 72.

Year	Cattle and calves	Beef cows	Other beef animals	Dairy cows	Other dairy stock[2/]
	On farms January 1[1/]				
	Million head				
1955	96.6	24.9	36.7	21.3	13.7
1956	95.9	24.7	37.1	20.8	13.3
1957	92.9	23.9	35.7	20.2	13.0
1958	91.2	23.5	36.0	19.3	12.4
1959	93.3	24.5	38.9	18.2	11.7
1960	96.2	25.7	41.5	17.6	11.4
1961	97.7	26.6	42.8	17.4	10.9
1962	100.4	28.0	44.6	17.1	10.7
1963	104.5	29.8	47.7	16.6	10.4
1964	107.9	31.9	50.1	16.0	9.9
1965	109.0	33.4	50.7	15.4	9.5
1966	108.9	33.5	52.0	14.5	8.9
1967	108.6	33.7	52.7	13.8	8.4
1968	109.2	34.5	53.2	13.3	8.2
1969	109.9	35.3	53.7	12.8	8.1
1970	112.3	36.4	55.4	12.6	7.9
1971[3/]	114.6	37.6	56.7	12.4	7.9
1972[4/]	117.0-118.0				

1/ Data estimated prior to 1965, except total cattle and calves on farms.
2/ Includes estimate of replacement heifer calves.
3/ Preliminary.
4/ Forecast.

Source: Economic Research Service, U.S. Department of Agriculture.

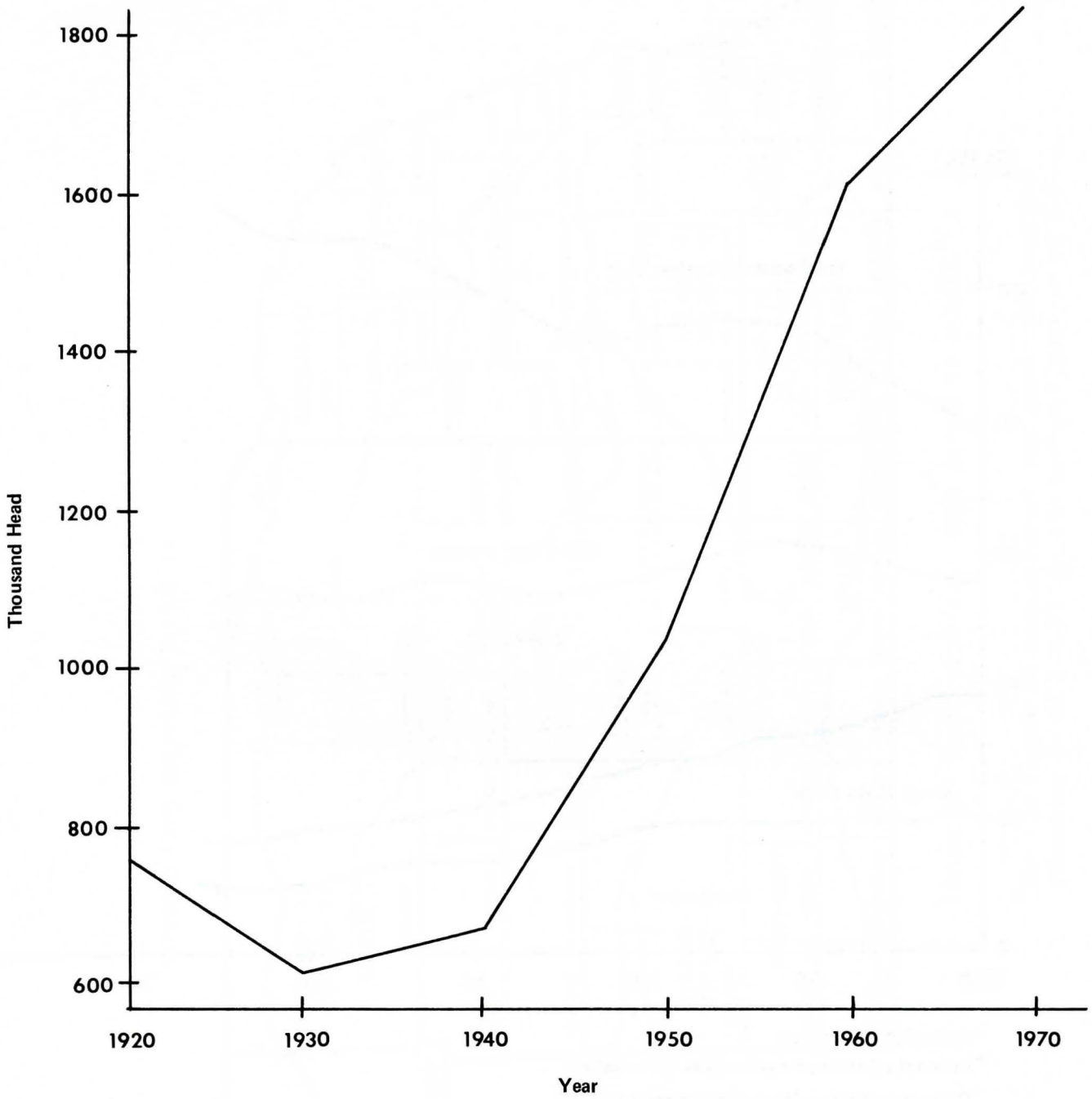
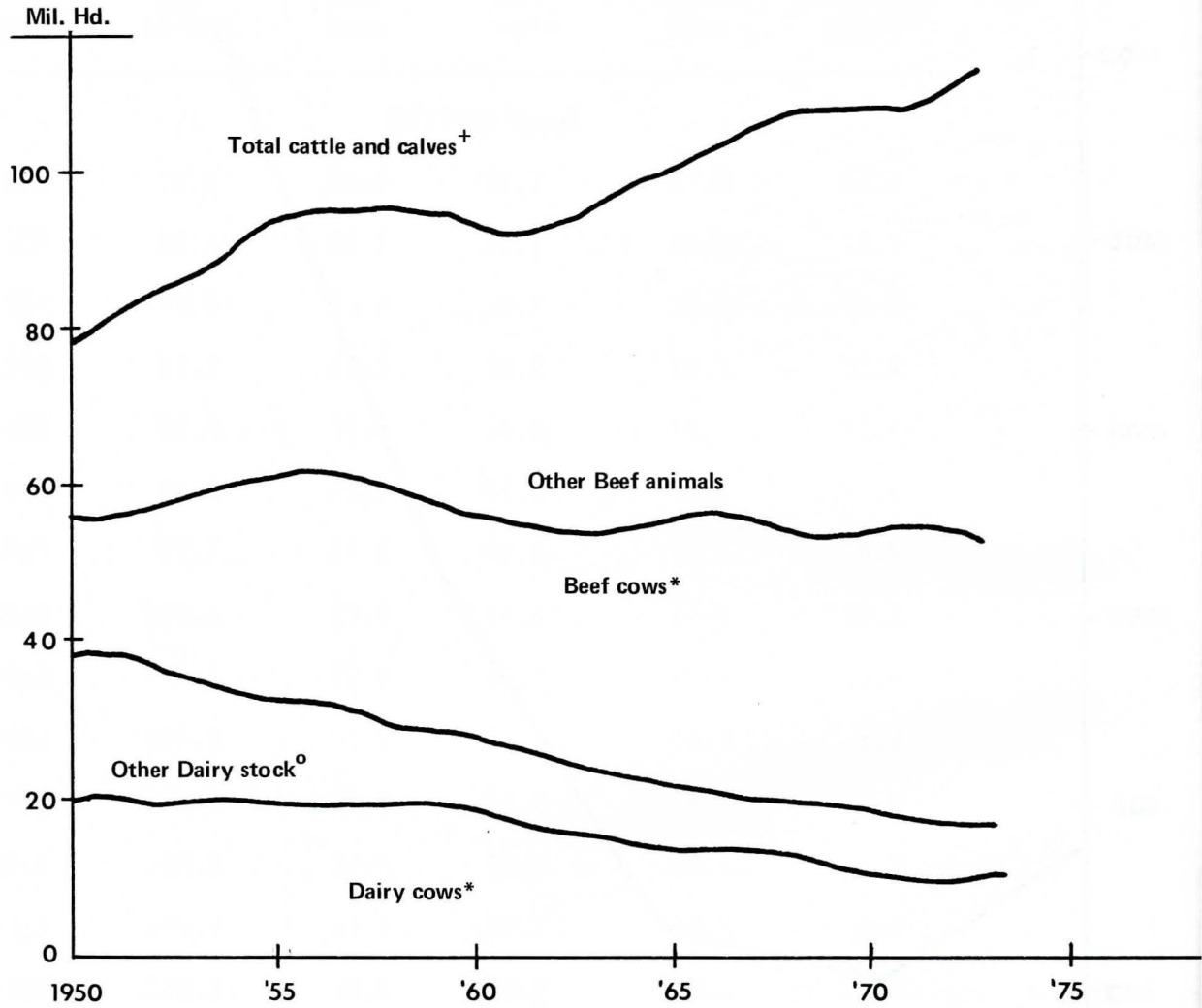


Figure 1. Beef cows and heifers two years old and over in Nebraska.



*Cows that have calved

°Includes estimate of replacement heifer calves.

+Reported all other data estimated prior to 1965.

Source: Economic Research Service, U.S. Dept. of Agriculture.

Figure 2. Cattle on farms, January 1, 1950-71.

Nebraska Crop Reporting Districts

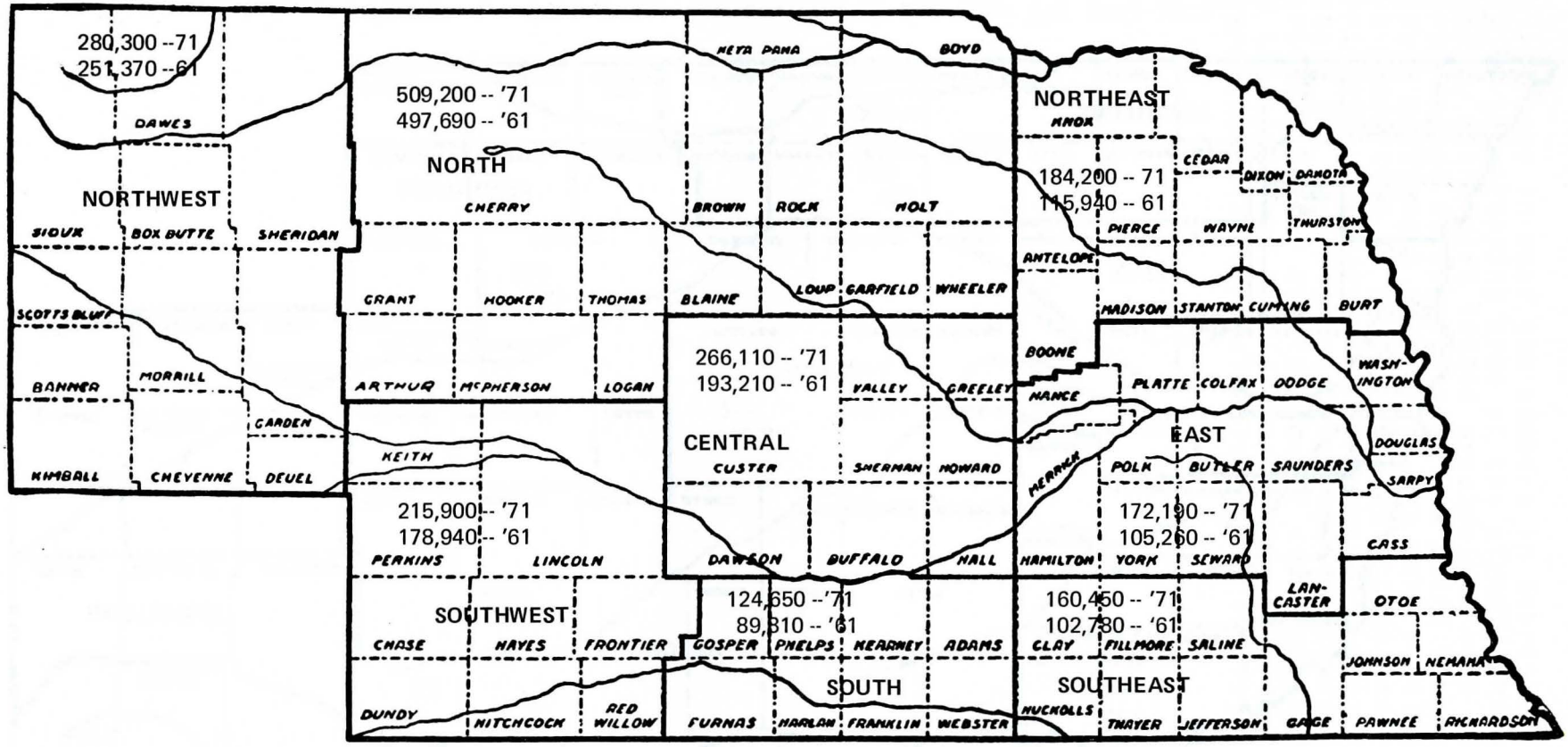


Figure 3. Beef cow numbers from 1-1-61 to 1-1-71.[a]

[a]The top figure in each district represents the beef cow inventory as of 1-1-71 and the bottom figure as of 1-1-61.

Source: State-Federal Division of Agricultural Statistics, USDA-Nebraska Department of Agriculture.

Nebraska Crop Reporting Districts

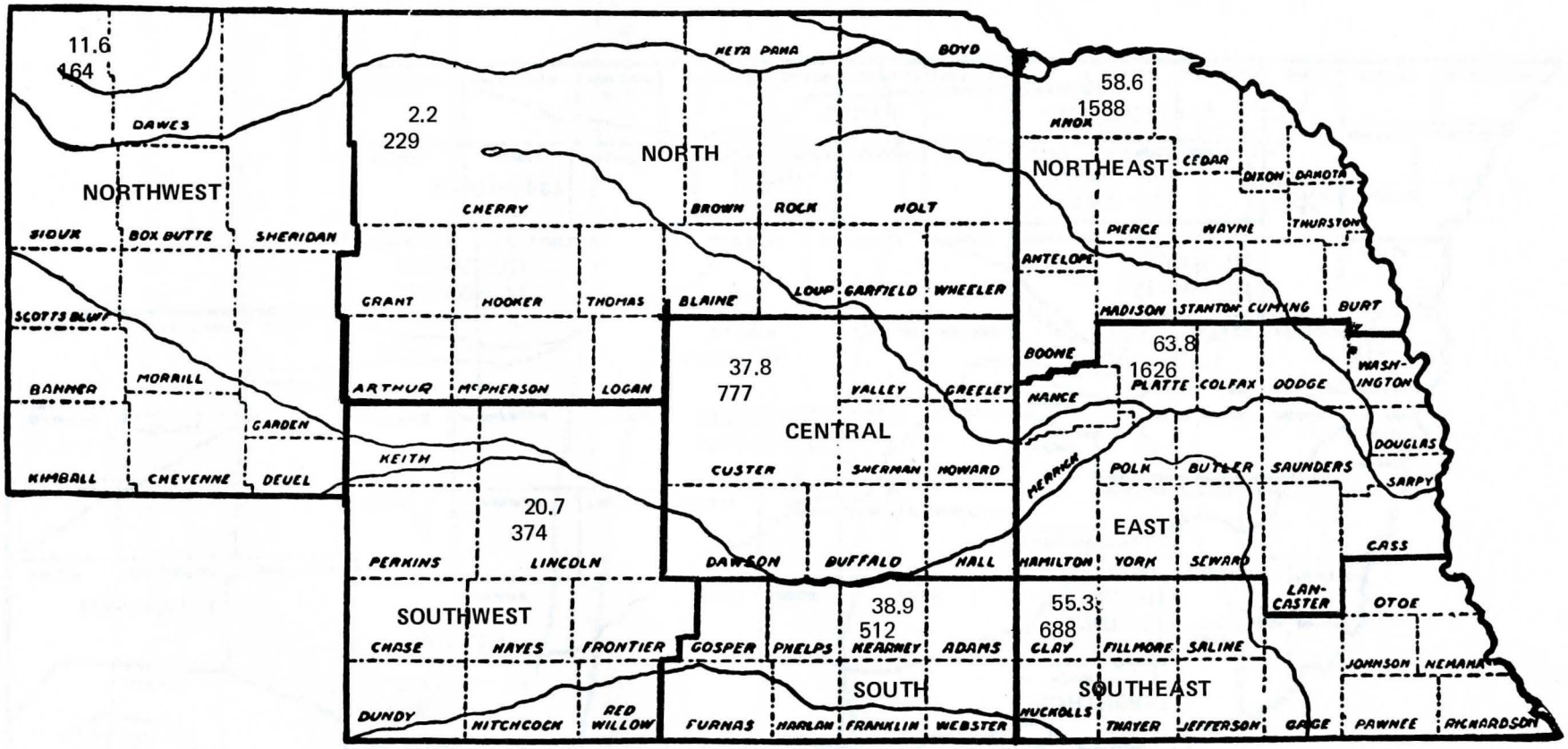


Figure 4. Corn acres and cow number increase (%) 1961-1971.[a]

[a]The top figure represents percent of beef cow number increase, the bottom figure, the corn acreage in thousands of acres in 1971.

Source: State-Federal Division of Agricultural Statistics, USDA-Nebraska Department of Agriculture.

The increase in beef cow numbers in Nebraska has been primarily in the cropping area of the state. The western 2/3 of the state, where warm season grazing has been the dominant summer program, has during the past few years increased production through management practices, but more particularly through intensive production of grass and other crops under center pivot irrigation. Increasing cow numbers in the grazing area of the state due to irrigated grass has great potential; however, it appears that better utilization of crop refuse in the farming areas of the state may provide more potential for increasing cow numbers than will be available in the traditional grazing areas.

SECTION II

RESOURCES CONCERNING NEBRASKA'S BEEF COW-CALF INDUSTRY

Climate, Land, Water and Feed

John K. Ward

Climate Favorable for Cow-Calf Production

Climatic conditions in Nebraska, although sometimes severe during winter weather, are generally favorable for cow-calf production. Mean temperatures are shown in Table 1.

Table 1. Temperature Means and Extremes at Selected Stations. (Degrees Fahrenheit)

	Normal Mean[a/]		Extremes[b/]	
Location	Jan.	July	Record High	Record Low
Lincoln	24.9	79.4	117	-24
Scottsbluff	25.3	74.7	110	-45
Valentine	20.0	75.4	110	-38
Norfolk	19.4	77.0	113	-26
North Platte	24.0	76.1	112	-35

[a/] Average Annual for period 1931 thru 1960.
[b/] Prior to 1968.

Source: U.S. Weather Bureau Climatic Summaries.

Land Adapted for Forage Production

The 1972 Agriculture Census shows 77,227 square miles and 71,000 farms in the state of Nebraska with an average size of 677 acres. In 1970 land used for grazing livestock in Nebraska included:

Crop land used only for pasture	--	2,461,216 acres
Wood land pastured	--	244,856 acres
Other pasture	--	23,121,383 acres
Total Land Pastured	--	25,827,455 acres

In addition to land used only for grazing, Nebraska has a large quantity of forage available in the form of crop residue, either as harvested or grazed feed.

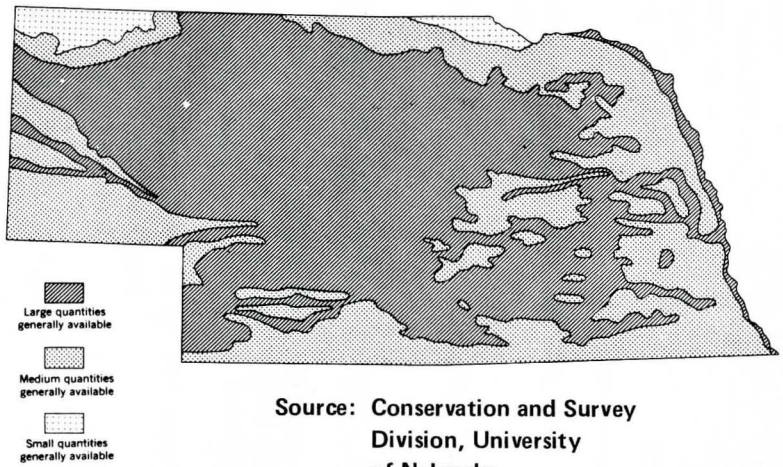
The carrying capacity of Nebraska grasslands varies considerably. From 7-10 acres of Sandhills native warm season grass will be needed per cow-calf unit for 5 months of summer grazing. In southwestern Nebraska the stocking rate is somewhat lighter. In eastern Nebraska on improved pastures the summer stocking rate might be as high as 1 cow-calf pair per 1½ - 3 acres. Irrigated pastures might carry 2 cow-calf pairs per acre during the summer grazing season.

Water, Both Quality and Quantity

Nebraska has vast water resources, consisting of both surface and ground water. Available ground water underlies most of Nebraska, as shown in Figure 1 with river systems shown in Figures 2, 3 and 4.

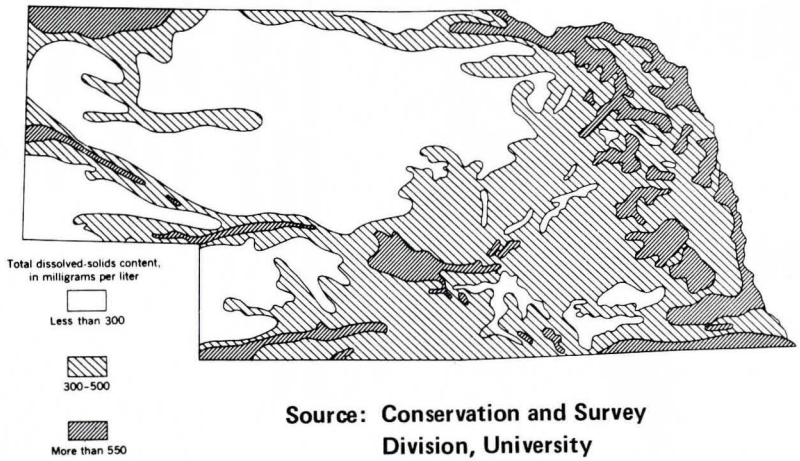
During the past decade, the number of irrigation wells in the state has increased from approximately 24,000 to 39,505 as of January 1, 1973. The number of acres under irrigation during the same period has increased about 2½ million to about 4½ million.

Figure 1 AVAILABILITY OF GROUND WATER



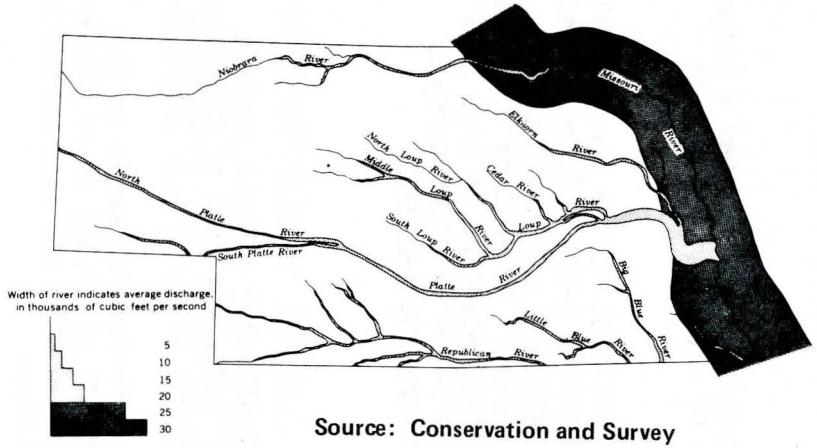
Source: Conservation and Survey Division, University of Nebraska

Figure 2 GROUND WATER QUALITY



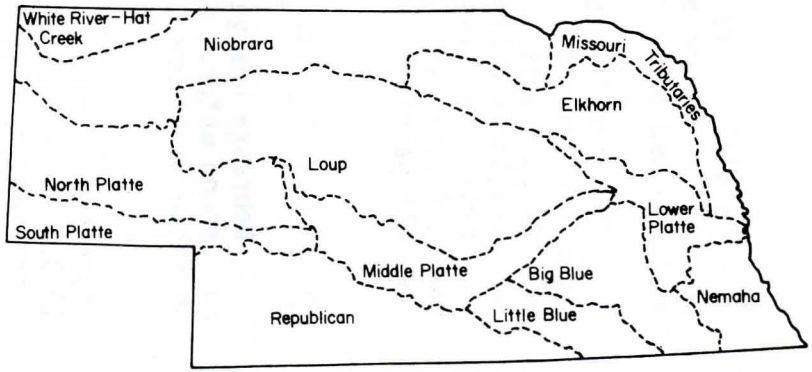
Source: Conservation and Survey Division, University of Nebraska

Figure 3 AVERAGE DISCHARGE OF PRINCIPAL RIVERS



Source: Conservation and Survey Division, University of Nebraska

Figure 4 NEBRASKA RIVER BASINS



Projections for land under irrigation by 1980 are approximately twice the current number of irrigated acres. There exists a total of 7,015,000 acres highly suited for irrigation, as seen in Table 2.

Table 2. Suitability of Lands for Irrigation

	Area (1,000 Acres)				
	Suitability Type[a/]				
	A	B	C	D	TOTAL
White River - Hat Creek	42	60	117	7	226
Niobrara	585	597	781	220	2,183
Missouri Tribs.	198	173	371	54	796
North Platte	343	363	453	103	1,262
South Platte	387	354	422	58	1,221
Middle Platte	821	163	295	125	1,404
Loup	647	369	634	349	1,999
Elkhorn	757	484	804	266	2,311
Lower Platte	306	275	496	68	1,145
Republican	967	626	821	112	2,526
Little Blue	649	147	216	18	1,030
Big Blue	1,148	335	468	35	2,006
Nemaha	165	344	542	36	1,087
NEBRASKA	7,015	4,310	6,420	1,451	19,196

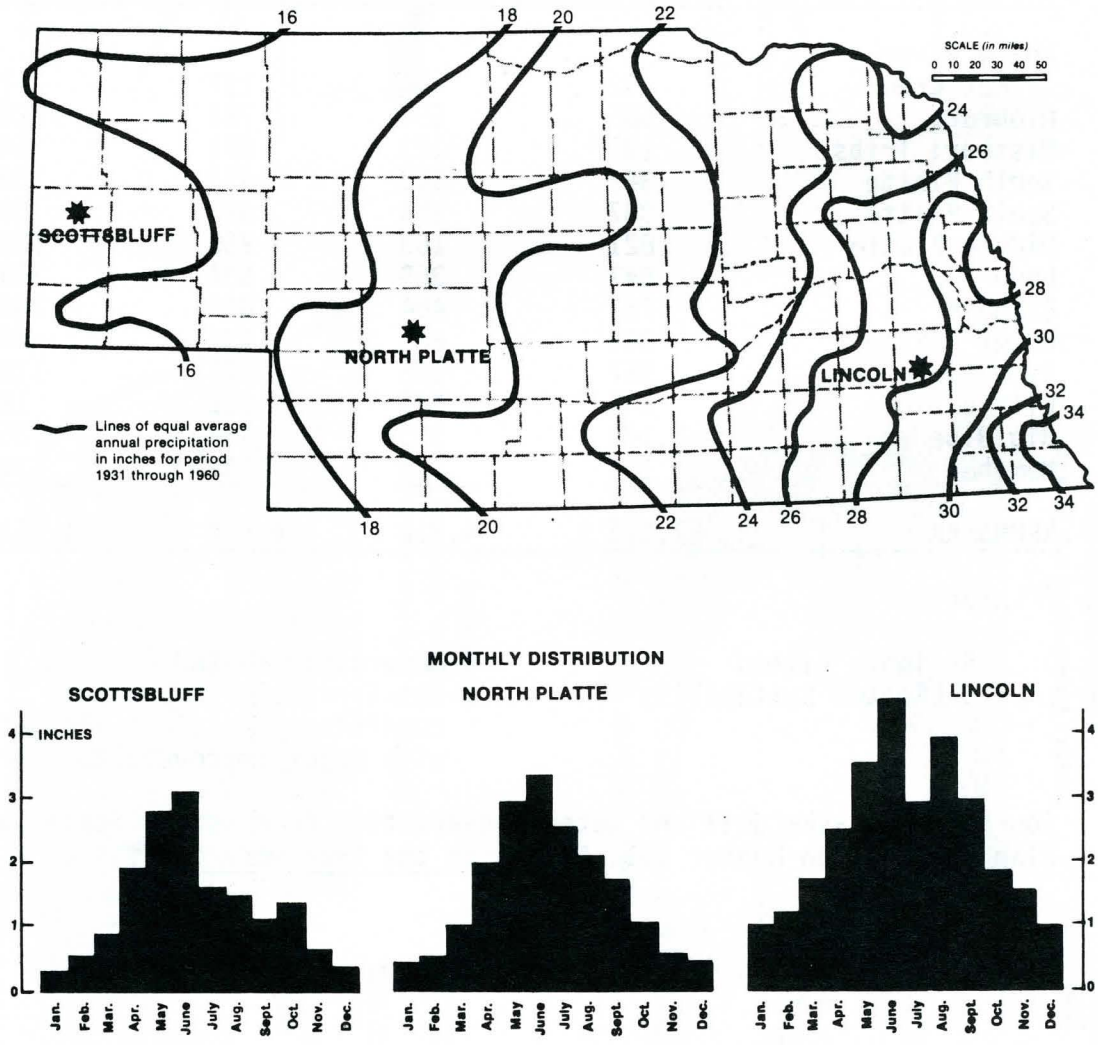
[a/] Legend

A-Highly suited
B-Moderately suited
C-Limited Suitability
D-Not irrigable in present condition. Possible irrigation with major improvements.

Source: Nebraska Soil and Water Conservation Commission, State Water Plan Publication Number 101, Report on the Framework Study.

Precipitation, although varying considerably, is generally adequate for production of forage for grazing purposes. Precipitation characteristics are shown in Figure 5, along with monthly distribution of annual precipitation.

Figure 5 PRECIPITATION CHARACTERISTICS



Monthly distribution of average annual precipitation in inches for period 1931 through 1960

Feed Available for Cow-Calf Expansion

Nebraska has an abundant supply of roughage of various kinds and qualities for use in both cow-calf and finishing programs. Roughage supply available in Nebraska, in addition to grazing lands previously mentioned, is shown in Table 3.

Table 3. Crop Acreages in 1972.

Corn	5,680,000	Acres*
Wheat	2,793,000	" *
Oats	402,000	" **
Barley	38,000	" **
Rye	75,000	" **
Sorghum	1,997,000	" *
Soybeans	39,000	" **
Wild hay	2,100,000	" **
All hay	4,150,000	" **

* Acres planted.
** Acres harvested.

Although Nebraska placed over 4 million cattle on feed in 1972, only slightly more than half of the feed grain produced was used for livestock feeding.

Forage from crops mentioned in Table 3 is available as crop residue. Corn or milo stalks can be grazed during the winter or harvested for use as emergency or supplemental feed. Yields of harvested crop residues after grain harvest will be from 1-2 tons per acre. With proper supplementation, crop residues are an available source of energy for beef cows.

Feed grain production and utilization is shown in Table 4.

Table 4. Feed Grain Production and Utilization Rate by Crop Reporting District.

Crop Reporting District	1966-70 average Feed Grain Production[a] (Bushels)	Livestock Utilization Rate[b] (Percent)
Northeast	81,992,000	104
East	147,947,000	51
Southeast	86,713,000	42
Central	60,068,000	55
South	49,823,000	31
North	12,357,000	99
Southwest	23,530,000	45
Northwest	10,250,000	122
NEBRASKA	472,680,000	60

[a] Feed grain production shown as bushels of corn equivalents. Wheat production is not included.
[b] Percent used for livestock feeding.

Source: State-Federal Division of Agricultural Statistics, USDA-Nebraska Department of Agriculture.

Nebraska at present is producing enough feed grains to finish nearly twice as many cattle as were fed in 1972.

SECTION II

RESOURCES CONCERNING NEBRASKA'S COW-CALF INDUSTRY

Genetic Resources for Beef Improvement

James A. Gosey

Beef improvement requires identification and utilization of present genetic resources. Nebraska has 2.112 million beef cows, composed of approximately 15 different breeds and many breed crosses. Necessary to beef improvement via selection is the presence of genetic variation. This genetic variation is a primary genetic resource. Genetic variation exists in all traits of economic importance in beef cattle today, within breeds as well as between breeds and breed crosses. The real issue in beef cattle improvement is the potential for capitalizing on these genetic resources to identify cattle of superior genetic composition and to utilize this superiority through breeding programs which will actually improve the genetic composition of future generations of beef cattle.

Thus the basic and often overlooked resource in beef improvement is people; for only people can make decisions which bring about substantial genetic improvement. People decide which herd sires to use, people decide which matings are made, people decide which traits to emphasize, people decide which cows are to be culled, people decide which replacement heifers to keep, people decide how to measure a given trait, people decide which breeds or breed crosses to use, people decide to what extent performance records will influence selections and thus, people decide how much and how fast genetic improvement is accomplished.

Have we capitalized on genetic and human resources to improve beef cattle? Only in the last few years have breeders begun to recognize the tremendous potential for improving beef cattle in traits of economic interest. The generation interval of cattle is about 5 years, but the generation interval of ideas is about 25 years. Performance testing has been recognized as a valuable tool in improving the accuracy of selection for at least 20 years, however, performance records have been fully utilized by only a small minority of Nebraska beef cattle breeders. It is imperative that seedstock producers use performance records to identify superior performance and then provide the commercial bull buyer access to this information. The surface has barely been scratched concerning the potential for beef improvement through genetic and human resources.

Because cattle have a long generation interval (5 years), a low reproductive rate (1 calf per year) and are expensive per individual, the intensity of selection is low, especially in cows. The major portion of genetic change which occurs in a herd will therefore be due to the relative superiority or inferiority of bulls used. Most cattlemen accept

the tremendous importance of the bull, but the problem of identification of such bulls remains.

Beef cattle producers must make two major decisions when they purchase bulls; (1) which herd to select bulls from and (2) which individual(s) to select within that herd. These decisions must be based on fact, not on emotion or promotion. These facts are objective, accurate records of individual and progeny performance in specific traits of economic importance.

Most beef breed associations now have viable performance recording programs available to their breeders. These programs will increase in scope and precision as breeders demand more than the traditional ancestral recordation service offered by most breed associations in the past. Several breed associations are actively involved in a National Sire Evaluation program today, and by 1980 those who have not been involved in such self-evaluation may find themselves well out of the mainstream of the beef breeding business. Such concepts as "breeding value analysis" to predict breeding values of bulls based on individual, progeny and collateral relative performance records is not 5 years down the road, it is now, and is being used by innovative beef breeders today.

When several traits are considered collectively, the effect of hybrid vigor is large. For example, in the experiments conducted at Fort Robinson involving Hereford, Angus and Shorthorn, crossbred calves were 19 pounds heavier at weaning than straightbreds. Survival and percent calf crop weaned was 3 percent greater in crossbred calves. Expressed as pounds of calf weaned per cow exposed we find a 28 pound advantage to the crossbreds. When crossbred cows were used in a systematic approach, increases in calf crop percent and weaning weight of their calves resulted in 48 pounds more calf weaned per cow exposed in the breeding pasture.

Systematic crossing of breeds for commercial production, combined with performance selection within breeds to provide bulls to commercial producers, is the most effective means of making genetic improvement.

In times when beef prices are favorable, relative to past years, it is easy for producers to become lackadaisical about the genetic improvement of beef cattle and the profit potential therein. However, beef breeders must remember that when prices are becoming more favorable costs are undoubtedly increasing also. Thus, in the final analysis, efficiency of production is vitally important today and will be even more important in the future.

The profit potential to cattlemen through performance inputs and genetic improvement of beef cattle has hardly been tapped in Nebraska. Nebraska has many resources which can contribute to this improvement, but the greatest improvement will come through the efforts and ideas of our greatest resource -- our people!

SECTION III

ECONOMICS OF PRODUCTION

Capital Requirements, Cost and Returns and Other Economic Considerations

Philip A. Henderson

Basically, farmers have three or four resources with which to work, i.e., land, labor, capital and managerial skills. The "name of the game" is to put these basic resources together in ways that will maximize returns to them. For some people, maximizing returns will be heavily weighted by personal satisfactions; for others, it will be almost entirely a matter of dollars and cents.

For those who are interested in the financial aspects, the information presented on the following pages is offered as an aid in thinking through the financial requirements of a beef cow herd and the potential returns.

RESOURCE REQUIREMENTS COMPARED TO OTHER ENTERPRISES

From an overall farm management point of view, beef cow herds fit best in situations where capital is not severely limited, land suitable only for pasture is plentiful, large quantities of comparatively low quality winter roughage are available, labor is readily available during the calving season but limited during the summer months and there is a strong liking for beef calf production.

The information shown in Table 1 gives a rough idea of the relative input requirements for cow herds and other enterprises common to Nebraska agriculture.

If pasture is excluded, the amount of operating capital required for a cow herd is relatively low compared to other livestock enterprises shown, but the amount of investment capital is comparatively high.

Labor requirements for beef cow herds are moderate in total amount and very seasonal when herds are handled in the conventional manner.

Risk associated with a cow herd is generally considered low. Once the initial investment in breeding stock is made, additional annual cash or cash-equivalent inputs are low on a per head basis for cows; hence the number of years when income is less than out-of-pocket cost is very small.

Table 1. Estimated Ranges of Input Requirements and Returns per Hour of Labor for Major Crop and Livestock Enterprises.[a]

	Irrigated Corn	Dryland Corn (Eastern Nebr.)	Soybeans	Conventionally Handled Cow Herd	Cattle Feeding		Farrow-Finish Hogs
					Calves	Yearlings	
	(per acre)	(per acre)	(per acre)	(per head)	(per head)	(per head)	(per sow & 2 litters)
Operating Capital	$40-60	$20-35	$15-25	$40-60[b]	$90-125[b]	$80-110[b]	$375-475[b]
Investment Capital[c]	$500-750	$300-600	$300-600	$1000-1400	$200-300	$250-325	$650-1250
Labor, hrs.	3-6	2-3	2-3	5-10	5-8	2-5	20-35
Risk[d]	+++	++	++	++	+++	++++	+++
Management Requirement[d]	+++	++	++	++	+++	+++	++++
Return/hr. for Labor & Management	$1.50-5.00	$1.50-3.00	$1.50-500	$0.00-3.00	$0.00-4.00	$1.00-4.00	$1.00-5.00

[a] Assuming long time relationships and above average management.

[b] Includes value of saleable hay and grain fed but no pasture or the value of the animal itself.

[c] Includes value of land, machinery, equipment and animals.

[d] No. of plus signs indicates approximate degree of risk or management.

Cow herds can be kept with some degree of success under a wide range of management skills. If a herd is to be truly profitable in the sense that all costs are covered and something is left for management, a considerable amount of good management is necessary. On the other hand, there probably is no other livestock enterprise that can put up with the lack of good management and still come up with a return higher than out-of-pocket costs as well as beef cows.

CAPITAL REQUIREMENTS

The amount of capital required to enter the beef calf production business depends on: 1) cattle prices in the year of entry; 2) whether you are buying a complete production unit, including land, or are simply adding a cow herd to your farming operation; 3) how you go about procuring your cow herd; 4)whether you buy strictly commercial cows of a given breed, crossbreds, or purebreds; 5) the time of year you buy; 6) the kind of skill and judgment you exercise in making your purchases.

Total Requirements Including Land

Table 2 gives capital investments in the general farming area of Nebraska and in the Sandhills ranching area. Actual investments for particular situations would differ from these figures because of differences in local land prices, productivity of pasture and hay land, etc., but it is generally recognized that investments in land, cattle, and specialized cattle equipment will be less on a per-cow-unit basis in the general farming area than in the Sandhills.

Table 2. Estimated Capital Investment for a Beef Cow Herd on a per Cow Basis, early in 1973.

	Sandhills Ranches in Nebraska	Crop and Livestock Farms in Eastern Nebraska
Cow	$350*	$350*
Heifers	50*	50*
Share of bull	1/25, 30*	1/30, 25*
Pastureland	15-16 acres,930	3-4 acres,700
Hayland	1 1/4 - 1 3/4 acres,188	.5 acre,250
Buildings and equipment	10	35
Horses	5	--
TOTAL	$1563	$1410

*Average values while in herd based on early 1973 prices.

Adding Beef Herd to Existing Business

Farmers who are considering adding a cow herd to their farming operation need not think in terms of the entire amount of capital shown in Table 2. They are concerned only with the amount needed to buy the breeding animals and any specialized equipment deemed necessary. The figures shown in Table 3 give a range of investment amounts that might be involved for each of three different methods of acquiring a herd.

Table 3. Estimated Amounts of Initial Investment Capital Required to Establish a 30 Cow Herd (a One Bull Unit) of Beef Cows at early 1973 Prices.

Investment Items	By buying heifer calves	By buying pregnancy-tested 3-5 year old cows	By buying "cull" cows in fall right after weaning, pregnancy tested
30 head of cows	----	$11,250 to 14,000	$7,500 to 9,000
36 head of heifers	$6,500 to 8,500	----	----
One bull	800 to 1,200	800 to 1,200	800 to 1,200
Special cattle equipment	0 to 600	0 to 600	0 to 600
TOTAL	$7,300 to 10,300	$12,050 to 15,800	$8,300 to 10,800

Buying Young Cows Ready to Produce

Buying pregnancy tested cows, three to five year old, would require the most capital. It has the advantage of getting a person into calf production quickly. The first crop of calves would be ready for sale as weaned calves within 8 to 12 months. A variation of this method of entry would be to buy cows with calves at their side. This would eliminate some risk and uncertainty, but this assurance will probably cost the buyer another $25 to $50 per cow.

Buying "Cull" Cows

Some people have purchased "cull" cows with the idea of getting at least one and hopefully two crops of calves out of them. Nearly all heifer calves are kept back for replacement purposes so that by the

third year approximately 1/3 to 2/5 of the herd would consist of two year old cows. How successfully this method works depends a great deal on how well the buyer can judge the health and age of cows purchased. The person who is not familiar with cattle should either hire a dependable order buyer or choose some other means of getting into the cow business.

Buying Heifer Calves

The third method, buying heifer calves and growing them out, involves a little less capital initially but it should be remembered that there will be no income for at least 16 months, and if the heifer calves are bought soon after they are weaned, it will be nearly two years. In order to be sure of having 30 producing cows, it probably will be necessary to buy 5 or 6 extra heifers to offset possible death losses, failure of yearling heifers to breed, etc.

Crossbreds and Purebreds Cost More

Buying crossbred females either as calves or as 3 to 5 year-old cows probably will cost more as the benefits of using crossbred females becomes more generally recognized by both buyers and sellers.

Purebreds will cost more, and from a commercial production viewpoint, may actually be no more productive than good quality grade cows. Since this report is primarily concerned with feeder calf production, nothing more will be said about investments and costs or returns associated with purebred herds.

Although the figures shown in Table 3 are in terms of a 30 cow herd, anyone interested in establishing a larger herd can use these figures in arriving at investment capital requirements for the larger herd by multiplying by the appropriate factor. For example, the man who is interested in a 100 cow herd could multiply these figures by 3 1/3. About the only difference would be in the amount spent for bulls. He would necessarily have to decide whether to use only three bulls or move to 4 bulls, i.e. one to every 25 cows.

Cow herds of less than 30 cows are not generally recommended, but there may be situations where keeping fewer than 30 cows is justified.

Leasing as a Means of Starting

Another method of getting established in the beef cow business would be to lease cows for a few years. Heifer calves could be held back for replacement purposes. This, of course, would require very little initial capital outlay,but the income from calves sold would be very little for

several years, particularly if the herd is leased on a share-of-the-calf-crop basis.

COSTS OF MAINTAINING A BEEF COW HERD

There is much confusion regarding the costs of maintaining a beef cow herd. A wide variety of costs can be found in magazine articles, bulletins, and oral statements. Part of the difference is due to differences in taxes, pasture charges, etc. from one area to another; but there are other differences due to the inclusion or exclusion of certain items such as charges for the use of stalk fields, equity capital, or the farmer's labor. Hence, every cost figure a person sees or hears should be critically evaluated from the standpoint of what that figure represents. (Does it include all costs? Or is it only a statement of part of the costs?)

Herd Costs

Tables 4, 5, 6, and 7 include estimates of typical costs associated with a beef cow herd which would be incurred by farmers in Nebraska under price conditions similar to those in early 1973 and the longer run. In each case, total costs are shown along with what might be called direct costs.

Total Costs

Total costs include charges for the use of stalk fields, interest on equity capital, labor, fixed costs on buildings and equipment used by the cattle, and an allocated share of general farm expenses which cannot be directly attributed to any particular crop or livestock enterprise. These total costs assume that there are other uses for stalk fields, equity capital, labor, and facilities and that cows should be expected to pay for the use of these resources if they are to have the use of them.

As indicated by the figures in Table 4, the total of all costs involved in maintaining a beef herd might amount to about $150 per cow on the basis of long-term cost conditions. In early 1973, however, these costs would amount to $195 or more. If an allowance is made for the net appreciation, the net cost is about $5 less.

No attempt has been made to show the variation in costs which may be associated with differences in weaning weights of calves. Very little information is available relative to differences in feed costs, etc.

Costs of keeping a beef herd have risen sharply within the past year, primarily as a result of the increased value of breeding stock and higher prices for hay and pasture.

Table 4. Estimated Annual Costs of Maintaining a 30 Cow Beef Herd.

	Early 1973 Price Conditions				Longer Term Price Conditions			
	Total Costs		Direct Costs		Total Costs		Direct Costs	
	entire herd	per cow	entire herd	per cow	entire herd	per cow	entire herd	per cow
Hay, 38 ton	$1145	$38.16	$1145	$38.16	$760	$25.33	$760	$25.33
Winter pasture	375	12.50	--	---	300	10.00	--	---
Summer pasture	1625	54.16	--	---	1390	46.33	--	---
Salt & mineral	50	1.67	50	1.67	55	1.83	55	1.83
Grain	35	1.17	35	1.17	30	1.00	30	1.00
Veterinary & medicine	115	3.83	115	3.83	125	4.17	125	4.17
Death loss	215	7.17	215	7.17	145	4.83	145	4.83
Taxes	140	4.67	140	4.67	105	3.50	105	3.50
Interest on cattle	1095	36.50	1095	36.50	625	20.84	730	24.33
Interest on feed & operating exp.	135	4.50	55	1.83	110	3.67	41	1.37
Labor @ $2.50/hr.	605	20.16	--	---	575	19.16	--	---
Use of bldgs. & equip.	170	5.67	70	2.33	165	5.50	65	2.17
Misc. cattle expense	110	3.67	110	3.67	120	4.00	120	4.00
General overhead	140	4.67	--	---	160	5.33	--	---
	$5955	$198.50	$3030	$101.00	$4665	$155.54	$2176	$72.53
Less net appreciation	180	6.00			140	4.67		
Net cost	$5775	$192.50			$4525	$150.87		

The total costs in Table 4 can be compared to an average cost of $158 per head on 18 Missouri farms in 1970 and to $129 a head on 6 of these Missouri farms that did the best job with their cow herds. Average costs on 65 north central Kansas farms amounted to $135 per cow in 1969.

The amount of taxes shown for 1973 are based on 1973 assessed values and a 55 mil levy, or approximately the average mil levy on all farm property throughout the state. The actual amount of taxes for any particular farm situation would vary by school districts.

The net appreciation shown is mostly attributable to replacement heifers. The appreciation of heifers more than offsets the depreciation of the cows and bull, thus resulting in a net appreciation for the entire herd. Replacement heifers were valued at $225 per head at weaning age, and $375 a head when they entered the producing herd as two-year olds. Values were increased to $460 a head for 3 and 4 year olds, and then decreased to a sale value of $265-275 a head. The bull was figured at a purchase price of $1120[1/] and a salvage value of $480 when he left the herd.

Direct Costs

The direct costs include only those costs that are incurred directly as a result of having the cow herd. These are estimated at $72.53 under long-term cost conditions and a little over $100 in early 1973,when the cost of summer pasture is not included. If there is a ready market for the summer pasture, however, the pasture charge would need to be included as a direct cost and would increase the total direct costs to $118.86 and $155.16 respectively.

All four totals omit the charge for winter pasture. This omission would be in line with the argument that this feed would remain unused and would therefore be wasted if cows didn't use the stalk fields. Omitting the charge for stalk pasture says in effect, that there would be no realistic possibility of using the stalks for any other kind of livestock, either on an owned or rented-out basis. It also ignores the organic matter and fertility values of these materials if they were incorporated into the soil.

Similarly, the charge for the farmer's labor is omitted entirely. Again, the assumption is that the labor needed for the beef cow herd would not be needed for other enterprises at any time during the year. As long as the herd is small, such an assumption may be quite realistic.

[1/] Value based on bull sales reported in Nebraska Farmer during January and February of 1973.

No charge is included for the fixed costs attached to buildings and equipment used by the cow herd on the ground that most of these costs would exist whether or not the cow herd was present. By the same token, the charge for the share of the general farm expenses is omitted.

COW COSTS

Conventionally Handled

Costs for the cows alone are shown in Table 5. Here it was assumed that one-sixth of the cows would be culled immediately after calving. Thus, the wintering costs for hay and winter pasture are based on only the 25 cows that would remain in the herd. Similarly, the amount of taxes shown would include only the taxes on the 25 head held over. Costs of wintering the heifers that will calve in the spring and the taxes on these heifers are included in the replacement heifer costs shown in Table 7.

Drylot Handling

Very little good information is available concerning the costs of maintaining a beef herd under drylot conditions during the summer months. Obviously, more harvested feed would have to be available in the form of collected shucks, stalks, and grain (as it comes out of the combine); silage; haylage; or hay. A limited amount of work done at the Mead Field Laboratory indicates that harvesting corn stalks for stalklage after the grain is harvested is not economically feasible with present methods. Perhaps one of the most important questions pertaining to drylotting cows during the summer centers around the fact that it would take more labor in most cases than if the cows were on pasture. In addition, health of the calves may be a major problem in drylot operations.

BULL COSTS

Many cost figures seen in various publications show bull costs at $3 to $6 per cow. The figures shown in Table 6 indicate that total costs of keeping a bull are much higher than this,even if the bull is depreciated over a 4-year period. One of the largest items of cost is depreciation. The 1973 figures on depreciation shown in Table 6 assume a purchase price of $1120[2/] and a selling price of $480. On this basis, bull depreciation alone would amount to more than $5 per cow. Direct costs, excluding pasture, amount to about $10-15 per cow (depending on how long the bull is kept), and $12 to $17 per cow if the charge for summer pasture is included.

[2/] Based on bull prices reported in the Nebraska Farmer in January and February of 1973.

Table 5. Estimated Annual Costs Associated with Only the Cows and Their Calves to Weaning.

	Early 1973 Price Conditions				Longer Term Price Conditions			
	Total Costs		Direct Costs		Total Costs		Direct Costs	
	entire herd[a]	per cow	entire herd	per cow	entire herd*	per cow	entire herd	per cow
Hay, 27.5 tons	$825	$27.50	$825	$27.50	$550	$18.33	$550	$18.33
Winter pasture	280	9.33	--	---	225	7.50	--	---
Summer pasture	1380	46.00	--	---	1185	39.50	--	---
Salt & mineral	40	1.33	40	1.33	44	1.47	44	1.47
Veterinary & medicine	90	3.00	90	3.00	100	3.33	100	3.33
Death loss	180	6.00	180	6.00	120	4.00	120	4.00
Depreciation	225	7.50	225	7.50	150	5.00	150	5.00
Taxes	110	3.67	110	3.67	80	2.67	80	2.67
Interest on cows	760	25.33	760	25.33	505	16.83	505	16.83
Interest on feed & operating exp.	100	3.33	42	1.40	80	2.67	33	1.10
Labor @ $2.50/hr.	440	14.67	--	---	440	14.67	--	---
Use of bldgs. & equip.	140	4.67	56	1.87	140	4.67	56	1.87
Misc. cattle expense	90	3.00	90	3.00	100	3.33	100	3.33
General overhead	120	4.00	--	---	120	4.00	--	---
	$4780	$159.33	$2418	$80.59	$3839	$127.96	$1738	$57.93

[a] Rounded to nearest $5.

Table 6. Estimated Annual Costs Associated with Ownership and Maintenance of Bulls.

	Early 1973 Price Conditions				Longer Term Price Conditions			
	2 Years		4 Years		2 Years		4 Years	
	total costs	direct costs	total costs	direct costs	total costs	direct costs	total costs	direct costs
Hay, 1.5 tons	$45.00	$45.00	$45.00	$45.00	$30.00	$30.00	$30.00	$30.00
Winter pasture	16.88	---	16.88	---	13.50	---	13.50	---
Summer pasture	63.00	---	63.00	---	54.00	---	54.00	---
Salt & mineral	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Veterinary & medicine	7.50	7.50	7.50	7.50	8.25	8.25	8.25	8.25
Death loss	5.60	5.60	5.60	5.60	3.73	3.73	3.73	3.73
Depreciation	320.00	320.00	160.00	160.00	214.00	214.00	107.00	107.00
Taxes	6.45	6.45	6.45	6.45	4.73	4.73	4.73	4.73
Interest on bull	54.40	54.40	54.40	54.40	36.27	36.27	36.27	36.27
Interest on feed & operating exp.	5.80	2.37	5.08	2.37	4.12	1.83	4.12	1.83
Labor @ $2.50/hr.	25.00	---	25.00	---	25.00	---	25.00	---
Use of bldgs. & equip.	9.30	3.72	9.30	3.72	9.30	3.72	9.30	3.72
Misc. cattle expense	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
TOTAL	$563.21	$450.04	$403.21	$290.04	$407.90	$307.53	$300.90	$200.53
Per Cow (30)	18.77	15.00	13.44	9.67	13.60	10.25	10.03	6.68

No allowance was made for investment credit in the bull costs shown. According to tax laws in effect in 1973, this would be a consideration and would reduce the bull costs slightly. In most cases, it would amount to no more than $1 to $2 per cow in the herd, however.

REPLACEMENT HEIFER COSTS

Some farmers and ranchers prefer to breed replacement heifers to calve at approximately two years of age. Others prefer to have them calve for the first time as three year olds. The approximate costs of growing heifers from weaning age to the time of the first calving are shown in Table 7.

If all costs (except bull charges) are included at the 1973 level, a heifer ready to calve as a two year old would involve total costs of approximately $400 by the time she is ready to drop her first calf, assuming that she was worth somewhere near $225 as a weaned heifer. The direct costs involved in growing a heifer from weaning age to two years of age amount to $102 if pasture costs are not included, or $133 if they are included. Thus, it is apparent that a person might have direct costs of $325 or more invested in a heifer by the time she calves as a two year old, and nearly $400 if she calves for the first time as a three year old.

INCOME

The income from a beef herd includes both the income from the sale of calves and that from the sale of cull breeding animals. From an income tax viewpoint, the income from the sale of calves is treated as ordinary income while the income from the sale of cull breeding animals usually qualifies as capital gains income.

Calf Sales

Income from calf sales depends largely on four things: the general level of cattle prices, weights of calves sold, quality of calves sold, and the number of calves sold compared to the number of cows in the herd.

Level of Cattle Prices

Prices of calves and feeder cattle in the fall of 1972 were higher than at any previous time. Prices in early 1973 were still higher. The trend of feeder calf prices during the 1960's is shown in Table 8. Note that prices have been substantially higher in 1970, 1971, and 1972 than they were in any previous years.

Table 7. Estimated Costs of Growing a Replacement Heifer from Weaning to Time of First Calving.

	Early 1973 Price Conditions				Longer Term Price Conditions			
	Calving as 2's		Calving as 3's		Calving as 2's		Calving as 3's	
	total costs	direct costs	total costs	direct costs	total costs	direct costs	total costs	direct costs
Hay, 1.5 tons	$45.00	$45.00	---	---	$30.00	$30.00	---	---
2.5 tons	---	---	$75.00	$75.00	---	---	$50.00	$50.00
Winter pasture	14.50	---	25.75	---	11.60	---	20.60	---
Summer pasture	31.00	---	73.10	---	26.65	---	62.65	---
Salt & mineral	1.00	1.00	2.50	2.50	1.10	1.10	2.75	2.75
Grain	5.75	5.75	---	---	4.70	4.70	---	---
Veterinary & medicine	3.00	3.00	4.00	4.00	3.30	3.30	4.40	4.40
Death loss	4.40	4.40	5.50	5.50	2.95	2.95	3.65	3.65
Taxes	5.50	5.50	9.15	9.15	4.05	4.05	6.70	6.70
Interest on animal	26.65	26.65	55.25	55.25	16.35	16.35	32.50	32.50
Interest on feed & operating exp.	5.30	3.11	15.75	8.65	4.50	2.65	12.70	6.71
Labor @ $2.50/hr.	25.00	---	33.75	---	25.00	---	33.75	---
Use of bldgs. & equip.	3.75	1.50	6.25	2.50	3.75	1.50	6.25	2.50
Misc. cattle expense	3.00	3.00	5.00	5.00	3.30	3.30	5.50	5.50
General overhead	3.00	3.00	5.00	5.00	3.00	3.00	5.00	5.00
TOTAL	$176.85	$101.90	$316.00	$172.55	$140.25	$47.90	$246.45	$119.70
Value of weaned heifer	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00
Total, including value of heifer	$401.85	$326.90	$541.00	$397.55	$365.25	$272.90	$471.45	$344.70

Table 8. Prices of Good and Choice Steer Calves at Kansas City, 1963 - 1972.

1959	$32.65	1964	$22.57	1968	$29.10
1960	27.88	1965	23.70	1969	32.89
1961	27.77	1966	28.38	1970	36.73
1962	27.69	1967	28.00	1971	39.25
1963	27.02			1972	46.79

The important question for those contemplating the start of a beef cow herd is: What will the price of calves be in the years ahead? There is no way of accurately foretelling this. It is doubtful whether calf prices will remain at 1972-73 levels more than a few years but it is almost certain that they will be higher than the prices shown for the years 1963 through 1968 if production of feeder cattle is to keep pace with the demand for beef. Prices similar to those shown in Table 9 might be reasonable to use in estimating the probable income from a cow herd in the late 1970's.

Table 9. Fall Calf Prices at Omaha According to Sex, Weight, and Grade, 1969-71.a/

	Weight of Calves in Pounds					
	550	500	450	400	350	300
Steer Calves	(dollars per cwt.)					
Choice	$36.20	$37.00	$37.80	$38.60	$39.40	
Good	31.70	32.20	32.75	33.30	33.85	
Heifer Calves						
Choice		33.20	33.90	34.65	35.35	$36.10
Good		28.30	29.00	29.70	30.40	31.15

a/Prices shown are based on October, November, and December quotations. Differences according to weight are interpolations between average prices quoted for 300-550 lbs. steer calves and 550-750 lb. steer and for 300-500lb.heifer calves and 500-700 lb. heifers.

Table 10. Fall Calf Prices at Omaha According to Sex, Weight, and Grade, 1972a/

	Weight of Calves in Pounds					
	550	500	450	400	350	300
Steer Calves			(dollars per cwt.)			
Choice	$47.08	$48.61	$50.13	$51.67	$53.20	$54.73
Good	41.12	42.10	43.08	44.06	45.04	46.02
Heifer Calves						
Choice		42.75	43.88	45.00	46.13	47.25
Good		36.17	36.87	37.57	38.27	38.97

a/Prices based on Omaha market during October, November, and December. Differences according to weight are interpolations based on published quotations.

Prices do vary seasonally within the year. This fact should be kept in mind if a person is thinking of fall calving. Year in and year out, calves sold in May or June should bring more than calves sold in the fall of the year according to the seasonal price pattern shown in Figure 1.

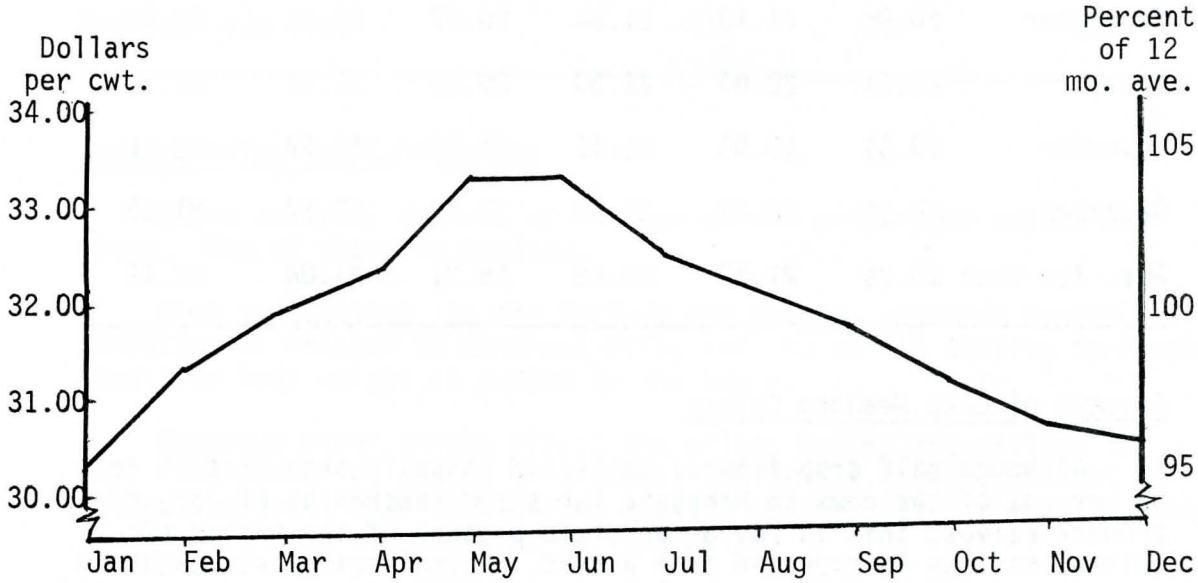


Figure 1. Seasonal Variation in Choice Steer Calf Prices at Kansas City, 1967-1971.

The three and four year average prices shown in Table 11 are probably a fair indication of prices which can be expected for cull cows during the late 1970's. Prices may be 20-25 percent higher than this during the years immediately ahead.

Table 11. Prices of Utility Grade Cows at Omaha, 1969-71.

Year	1969	1970	1971	1972	3 Year Average (1969-71)	4 Year Average (1969-72)
January	$17.22	$20.93	$19.98	$22.61	$19.38	$20.18
February	18.53	22.18	20.98	23.80	20.56	21.37
March	20.12	23.24	22.03	24.73	21.80	22.53
April	20.64	23.23	21.48	24.70	21.78	22.51
May	21.92	22.64	22.30	25.51	22.29	23.09
June	21.90	22.58	22.03	26.00	22.17	23.13
July	21.32	20.85	21.68	26.22	21.28	22.52
August	21.26	20.48	21.72	26.18	21.15	22.41
September	20.96	21.13	21.84	26.57	21.31	22.62
October	20.21	20.84	22.30	26.19	21.12	22.38
November	19.31	19.04	21.45	24.98	19.93	21.20
December	20.10	18.77	21.64	25.02	20.17	21.38
Ave. for Year	20.29	21.32	21.62	25.21	21.08	22.11

Percent of Cows Weaning Calves

Although calf crop figures published annually show that 90 to 92 percent of the cows on Nebraska farms and ranches as of January 1 produce calves, this is not an accurate picture of the number of calves that can be expected from a herd. Animal scientists estimate that a more accurate figure would be about 84 or 85 percent. In other words, of the females exposed to bulls (excluding those which are sold

because of cancer eye, age, serious injury, i.e., reasons other than reproductive), only about 85 out of every hundred cows actually produce a weaned calf. Good operators do much better than this. In small herds, a 100 percent calf crop is possible. Ordinarily, however, a 90 to 95 percent calf crop would be considered good to very good.

Weaning Weights

Weaning weights of calves depend on a number of factors including the genetic background, age of calf, age of dam, milk production of the dam, and whether or not the calf received any creep feed. The weights shown in Table 12 are an indication of the kinds of weights that could be expected under average management. Top notch management will produce much heavier calves. Since most calves are sold on a weight basis, it is important to strive for weaning weights better than those shown in Table 12.

Table 12. Average Weaning Weights of Calves According to Sex of Calf and Age of Dam.

	Steers	Heifers
2 year old cows	358	323
3 year old cows	377	342
4 year old cows	397	362
5-8 year old cows	417	382

Factors Affecting Calf Prices

There are many factors which bear on the price your calves may bring. One of these is quality.

What is quality? It may include eye appeal, apparent health, condition as related to abnormal fill, and the calf's ability to convert feed into body weight as judged by the buyer.

Numerous other things affect the prices buyers are willing to pay: the number of calves in a bunch, uniformity of size, weight of calves, reputation of cattle from a given source, etc. These and other factors all have a bearing on selling price.

The income from the sale of calves as it might be affected by quality (grade), percentage of cows producing weaned calves, and weaning weights is shown in Table 13. It is apparent from these figures that calf sales per cow can differ tremendously. With prices comparable to those of early 1973, the man who can wean a 95 percent calf crop with calves grading 90 percent choice and weighing 500 pounds at weaning can expect about $1,900 more income from a 30 cow herd, or about $60-65 more per cow than the man who weans only an 85 percent calf crop with calves grading 70 percent choice and weighing 350 pounds at weaning.

Table 13. Cash Income from Calves When Enough Heifers Held Back to Assure Replacement of 1/6 of Cows[a]

	90% Choice Calves Rest Good				70% Choice Calves Rest Good			
	Long-term Prices		Early 1973 Prices		Long-term Prices		Early 1973 Prices	
	Total	Per Cow	Total	Per Cow	Total	Per Cow	Total	Per Cow
95% Calf Crop								
500 lb. weaning wt.	$3974	$132	$5536	$185	$3837	$128	$5337	$178
450 lb. weaning wt.	3656	122	5146	172	3523	117	4977	166
400 lb. weaning wt.	3321	111	4722	157	3195	106	4580	153
350 lb. weaning wt.	2970	99	4263	142	2853	95	4146	138
90% Calf Crop								
500 lb. weaning wt.	3714	124	5173	172	3584	119	4992	166
450 lb. weaning wt.	3417	114	4812	160	3291	110	4654	155
400 lb. weaning wt.	3105	103	4416	147	2985	99	4284	143
350 lb. weaning wt.	2777	93	3988	133	2665	89	3880	129
85% Calf Crop								
500 lb. weaning wt.	3454	115	4812	160	3331	111	4634	154
450 lb. weaning wt.	3178	106	4474	149	3059	102	4324	144
400 lb. weaning wt.	2888	96	4108	137	2775	92	3980	133
350 lb. weaning wt.	2583	86	3710	124	2478	83	3606	120

a/Although only 5 cows would actually be replaced, animal scientists recommend that approximately 20 percent more heifers be kept back than will actually be needed. This gives greater assurance that the number of bred heifers actually needed will be available.

Under early 1973 price conditions, a 5 percent difference in the percentage of cows weaning calves changes average income per cow by about $8-9 when weaning weights are low and about $12-13 per cow when weaning weights are high.

With early 1973 prices, an extra 50 pounds on weaning weights would add $12-14 to actual sales per cow, assuming that enough heifers were kept back to assure the replacement of 1/6 of the herd.

A change of 10 percent in the proportion of calves grading choice changes income by about $2.00 to $3.50 per cow with prices and grade-price differentials comparable to those in early 1973.

Cow and Surplus Heifer Sales

In the example of a 30 cow herd which has been used, there would be 5 cows to be sold each year, unless some death loss is experienced. Since an allowance for death loss was included as one of the costs in Table 4, the full value of 5 cows can be figured in projecting possible income. On the basis of 1,000 pound sale weights, the sale of cows would amount to about $1,400 or about $45-46 per cow in the herd with prices comparable to those of early 1973.

The costs shown in Table 4 and the calf sales shown in Table 13 assume that 20 percent more heifers are held back for breeding than actually will be needed. The extra number gives greater assurance that there will be enough heifers actually bred to meet replacement needs. All heifers held back are exposed to the bull and the surplus heifers are then sold after the breeding season on the basis of pregnancy tests and quality. In the 30 cow herd example, there should be one extra heifer to sell, and, at 1973 prices, the income from the sale of this heifer might amount to approximately $300. This would average out to about $10 per cow in the herd.

TOTAL INCOME

Total income from calf sales, cull cows, and surplus heifers can be compared to herd costs by adding approximately $1,700 to the 1973 income figures shown in Table 13 and comparing the result to costs shown in Table 4. With prices comparable to early 1973, nearly all producers with a 95 percent calf crop would be able to cover total costs--even those with 350 pound weaning weights and calves grading 70 percent choice. Producers with a 90 percent calf crop would need weaning weights higher than 350 pounds in order to cover all costs; and those with 85 percent calf crops would need weaning weights of about 400 pounds in order to cover all costs.

With prices comparable to early 1973, the top notch cow man, producing a 95 percent calf crop with calves grading 90 percent choice and weighing 500 pounds at weaning, would be realizing a return of nearly $6.50 an hour in addition to paying all other expenses. In contrast, the poor manager (85% calf crop, 350 lb. weaning weights, and 70% choice grade) would be making only -$1.50 an hour for his time after paying all other expenses.

Return Above Direct Costs

The total return above direct costs exclusive of pasture for a 30 cow herd is shown in Table 14. The figures under "Early 1973 Prices" are based on: the 1973 calf sales shown in Table 13, an income of $1,400 from the sale of cull cows, $300 from the sale of a surplus heifer, and the 1973 level of direct costs shown in Table 4. The figures shown under "Long-term Prices," $1,100 income from the sale of cows, $225 from the surplus heifer, and the direct costs shown in Table 4 under "Long-term Price Conditions."

Table 14. Net Income Above Direct Costs (Excluding Pasture), 30 Cow Herd.

	90% Choice Calves Rest Good				70% Choice Calves Rest Good			
	Long-term Prices		Early 1973 Prices		Long-term Prices		Early 1973 Prices	
	Total	Per Cow	Total	Per Cow	Total	Per Cow	Total	Per Cow
95% Calf Crop								
500 lb. weaning wt.	$3198	$107	$4206	$140	$3061	$102	$4007	$134
450 lb. weaning wt.	2880	96	3816	127	2747	92	3647	122
400 lb. weaning wt.	2545	85	3392	113	2419	81	3250	108
350 lb. weaning wt.	2194	73	2933	98	2077	69	2816	94
90% Calf Crop								
500 lb. weaning wt.	2938	98	3844	128	2808	94	3662	122
450 lb. weaning wt.	2641	88	3482	116	2515	84	3324	111
400 lb. weaning wt.	2329	77	3086	103	2209	74	2950	98
350 lb. weaning wt.	2001	67	2658	89	1889	63	2550	85
85% Calf Crop								
500 lb. weaning wt.	2678	89	3482	116	2555	85	3304	110
450 lb. weaning wt.	2402	80	3144	105	2283	76	2994	100
400 lb. weaning wt.	2112	70	2778	93	1999	67	2650	88
350 lb. weaning wt.	1807	60	2380	79	1702	57	2276	76

The return above direct costs is the return to labor, management, and resources used by the cows but not charged to them. A well managed 30 cow herd, with 1973 prices, would add $3,400 to 4,200 to a farm's total return above direct costs (excluding pasture). Even a rather poorly managed herd would add $2,000 or better.

If pasture is included as part of the direct costs, the well managed herd would add around $1,800-2,600, while the poorly managed herd would add only $600-700. Expressed differently, 30 well managed beef cows would return as much above direct costs, including pasture, as 80-120 cows poorly managed.

The long run picture is considerably less favorable as indicated by Tables 14 and 15.

Table 15. Net Income Above Direct Costs (Including Pasture), 30 Cow Herd.

	90% Choice Calves Rest Good				70% Choice Calves Rest Good			
	Long-term Prices		Early 1973 Prices		Long-term Prices		Early 1973 Prices	
	Total	Per Cow	Total	Per Cow	Total	Per Cow	Total	Per Cow
95% Calf Crop								
500 lb. weaning wt.	$1808	$60	$2581	$86	$1671	$56	$2382	$79
450 lb. weaning wt.	1490	50	2191	73	1357	45	2022	67
400 lb. weaning wt.	1155	39	1767	59	1029	34	1625	54
350 lb. weaning wt.	804	27	1308	44	687	23	1191	40
90% Calf Crop								
500 lb. weaning wt.	1548	52	2218	74	1418	47	2037	68
450 lb. weaning wt.	1251	42	1857	62	1125	37	1699	57
400 lb. weaning wt.	939	31	1461	49	819	27	1325	44
350 lb. weaning wt.	611	20	1033	34	499	17	925	31
85% Calf Crop								
500 lb. weaning wt.	1288	43	1857	62	1165	39	1679	56
450 lb. weaning wt.	1012	34	1519	51	893	30	1369	46
400 lb. weaning wt.	722	24	1153	38	609	20	1025	34
350 lb. weaning wt.	417	14	755	25	312	10	651	22

INCOME TAX ASPECTS

A few years ago, a good many non-farm people were investing in cow herds for income tax reasons. The changes brought about by the Tax Reform Act of 1969 effected some changes; however, which now make investments in cow herds much less attractive from an income tax standpoint.

The Economic Research Service made a study of the financial benefits which might be derived from an investment in a beef herd. Their conclusions were that "Investments in beef breeding herds. . . are not profitable for non-farmer investors under current tax law provisions except at the 50 percent tax bracket and above, and there only if product prices and input costs are very favorable."

Their study indicated that non-farm investors, under the provisions of the current law, could expect a return of less than 2.5 percent on their investment if prices were 20 percent above 1970 levels and the initial cost of heifers as well as the cost of maintaining them were "low."

SECTION III

ECONOMICS OF PRODUCTION

Sources of Capital -

James D. Heldt and Frank H. Baker

The availability and costs of required capital is a key concern to livestock producers. If an individual has managerial, feed and labor resources available, the decision to begin or expand in the cow-calf business might hinge on the availability of credit.

Lenders view loans for breeding stock as providing a stockman the opportunity to increase his productivity and returns by better use of resources. As a result of the small size of the producing unit found in modern farms and ranches, a variety of lending agencies is the source of capital for expansion or development. Farmers and ranchers do not have access to capital sources equivalent to those of many large industries, which may obtain capital through the sale of shares of stocks, bonds and other securities. Each prospective borrower-lender relationship is an individual case and the circumstances of a loan vary accordingly depending upon the situation.

Credit needs of farmers and ranchers fit into intermediate term credit financing due to the nature of their business. Loans of 90 or 120 days are too short to finance livestock enterprises. Lenders have recognized this and provide loans up to a year or more. This is a necessity with beef cows which require financing up to a 3-year or 5-year basis.

With beef cow loans, repayment is usually made once a year when the calves are sold. If a farmer or rancher retains ownership in the calves for feeding, an additional loan is often provided on the calves. This loan is then paid off when the animals are sold.

Several lenders feel there is great potential for financing pasture improvement programs which would supplement a cow-calf operation. The key factor here, as in all cases, is identifying superior management ability for these situations.

Progressive lenders prefer to see a balance sheet, profit and loss statement and a cash flow. These financial management tools can be used to show financial position, income, expenses and credit requirements for the past and future. They are beneficial to both the prospective borrower and lender.

COMMERCIAL BANKS

Progressive bankers are willing to lend to people who are beginning or expanding their cow herds. Most commonly, banks will write a note for 6 or 12 months, while progressive bankers will make intermediate term loans on breeding animals. A 6- or 12-month note is reviewed annually. Terms of the loan usually call for payment of interest due and some payment on the principal. In most cases, the note is renewed for the smaller principal amount.

Notes written for this period of time enable both the banker and the borrower to evaluate the progress being made by the borrower and permit the lender to update the interest rate being charged. A financial statement is required by bank examiners. This statement enables both the borrower and lender to visualize how financing the cow loan may affect the financial status of a total operation.

Loans may be more easily obtained by the borrower who already has a cash income from land, hogs or cash-grain. Progressive commercial bankers also are more willing to lend to the producer who is using management techniques that will increase his level of efficiency. Good record keeping on cow herds, use of performance tested bulls, proper range and/or pasture management that could increase carrying capacity are but a few of the management techniques presently viewed as profit boosters.

FARMERS HOME ADMINISTRATION

The man who has grass and feed and cannot obtain sufficient credit elsewhere at reasonable rates and terms may be able to secure an operating type loan from the Farmers Home Administration to purchase livestock.

FHA, in general, finances beef operations in conjunction with other enterprises on the farm. Other lenders may provide some of the funds for the enterprises approved by FHA.

The most stable livestock program financed by FHA in Nebraska is the cow-calf program. Loans are drawn when the cows are purchased. The number of cows purchased will be based on the grass and feed available on the farm. The loans are set up on a 7-year note. If circumstances warrant, the note can be extended for another five years. Normally, the upper limit on such a loan will be 100 percent of the cost of the cow or up to $50,000. Repayments must be made at least annually, right after calves are sold.

Along with a loan from FHA, the farmer also gets some management guidance, at least for the first few years of the loan term. The county FHA supervisor works with the borrower in formulating a farm and home plan which is a cash-flow projection of the yearly income and expenses anticipated on the farm or ranch.

Under the new Consolidated Farm and Rural Development Act of 1972, the Farmers Home Administration can guarantee loans to be made by other recognized agricultural lenders in the area for livestock and other farm enterprise loans. In these cases, the other lender could be the local bank which would make the loan to the farmer or rancher for the type of livestock loan described above. The bank loan to the farmer, which is guaranteed by FHA, cannot exceed the size of a family farming operation or $50,000 total chattel debt limit by the primary lender.

This type of financing could make more credit available to Nebraska farmers and ranchers to market non-saleable feed and roughage through livestock.

FHA GRAZING ASSOCIATIONS

Farmers organize "grazing associations" in order to acquire additional land for pasturing their cattle at modest cost. These loans appear to work well for a beef man who has his own cows and facilities to feed them in winter, and has the feed to carry them for the 6 or 7 months of the year when they cannot graze association land.

To receive an association grazing loan, three or more farmers must go together and form a corporation to buy the extra grazing land. The program is mainly desigend to help family farmers who lack summer pasture. Members of the group seeking an association loan also must meet other FHA requirements. Generally, this means they are unable to get credit to buy land on their own.

When the group locates land to buy, F HA can loan up to 100 percent of the "fair market value" (according to FHA appraisal) at 5 percent interest for 40 years. The group also can borrow up to 100 percent for development, including pasture establishment, fencing, water, corrals, scales, and other needed equipment.

An important factor in the success of a grazing association is that the farmers involved must get along well together. Many of the more successful associations have fewer than five members.

During the organization of the association, finances are worked out and grazing charges determined. The association, with advice of FHA representatives, sets this charge on the basis of land cost, yearly fertility expenses and upkeep of facilities. The charge must be in line with income possibilities of the cattle actually using the pastures.

Additional information on farmer program loans for livestock development may be obtained at any of the 36 FHA county offices located throughout the state of Nebraska.

FEDERAL LAND BANK ASSOCIATION

The Federal Land Bank can provide loans for beef breeding herds if a first mortgage is taken on the farm or ranch real estate. The beef cow herd could be financed in conjunction with credit for pasture improvement. The local Federal Land Bank Association obtains loan funds through the sale of Federal Land Bank bonds backed by first mortgages on the farms or ranches on which loans are made.

Loans are made on the appraised farm value. The Federal Land Banks and local associations appraise the farms or ranches and supervise and administer the loans. Loans are generally made on 60-75 percent of the appraised farm or ranch value including land, buildings and equipment. The amount also considers the income and management ability of the borrower. The legal limitation is 85 percent of current market value.

Most lending is done on a 35-year basis with a 7½ percent interest rate presently. The interest rate of FLB loans varies directly with the cost of money.

PRODUCERS LIVESTOCK CREDIT CORPORATION

The PLCC serves a 10-state area which includes Nebraska. The funds for loans to farmers and ranchers are secured from the Federal Intermediate Credit Bank which sells debentures to the investing public.

Loans can be made to farmers and ranchers who are in a sound financial position and desire financing for pasture or breeding stock. The PLCC prefers a minimum of 25-35 percent margin on this type loan. The maximum period of loan repayment is one year. However, loans for breeding stock can be established on a renewable program or extended. This enables a farmer or stockman to market his livestock in an orderly fashion.

The amount that can be loaned to any one individual is determined by his financial position, management ability and past credit record. When livestock are sold, the full proceeds from the sale must be turned in and are applied on the principal of the loan. When the principal is paid off, the balance will be applied on interest which is 8 percent.

The PLCC requires a $25 loan service fee of its borrowers. The PLCC does not generally make split loans on livestock and does require a first lien on the cattle financed.

PRODUCTION CREDIT ASSOCIATION

The PCA is very willing to provide financing for beef herds to the qualified cow man with a means for success. This financing may be done in conjunction with other ranch or farm enterprises.

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Most beef cow financing is on a 3-year basis. The length of the loan is greater than 1 year and may be up to 7 years on an intermediate basis. Depending upon the managerial and financial ability of the borrower, the PCA may loan up to 100 percent of the breeding herd cost. However, a 70-30 share is most common with the borrower providing a 30 percent margin. The loan limit varies with individual cases.

Under certain circumstances loans are either renewable or expandable. All borrowers become stockholders in the PCA. The PCA requires all borrowers to purchase PCA stock in an amount equal to 10 percent of the loan. The investment in the stock is redeemed when the loan is repaid. Interest rates vary depending on the cost of money on the open market.

Obtaining a PCA loan begins with evaluating a prospective buyer's operating statement and operating ability. PCA managers encourage cow men to build their herd over a period of time as contrasted to beginning when they desire to be when completed. This allows for both management and financial success.

SECTION III

ECONOMICS OF PRODUCTION

Opportunities for Investing in Cow Herd Expansion -

Robert H. Hatch

The economic process has been defined as . . . "the allocation of scarce means among alternative ends." Economic growth, whether it is in the beef industry or other industries, consists of using available and expanding scarce means (resources) so more demands (alternative ends) can be met.

Consistent with its resources, the Nebraska beef industry has within the geographic boundaries of Nebraska what is considered as one of the top three grazing areas of the United States. In addition, vast acreages of cropland provide residual feed that will become increasingly important as cow herd expansion increases in those areas where crop residues can be used for beef production. In either case, the beef cow can usually harvest these materials more inexpensively than man and mechanized equipment.

In the High Plains area, of which Nebraska is a part, livestock marketing accounts for approximately two-thirds of the total farm marketings.

From 1950, per capita beef consumption has risen from 63 pounds to 115 pounds in 1972. As the trend continues, greater supplies of beef will be needed to meet the demands as the population and economic well-being of the U.S. increases. Several million more beef cows will be needed to produce the cattle which will meet these needs. This, then, should serve as the basis for opportunities in investment in cow herd expansion.

Changes in beef production methodology have been rapid during the past quarter of a century. As a result of technology and research there are more tools available to the beef producer today, which, in part, has resulted in greater production as compared to the early part of the 20th Century. Increased knowledge of animal breeding, nutrition, systematic use of crossbreeding, improved animal health and disease prevention are but some of the tools which have increased calving percentages, the percent calves weaned and pounds of calf produced. However, these increases have not been fast enough in the past to keep pace with the increasing demand for beef. Cow herd expansion, therefore, is necessary as a means of keeping pace with present and

future beef demands. With higher demand and population shifts, techniques and locations of beef production have been substantially altered. Because of its highly competitive nature, any innovation that permits production of a better product, more adapted to consumer needs and resulting in increased efficiency, is adopted readily.

Growth in the industry, combined with the impact of increased technology, has and will continue to influence both the amount of credit and kinds of financing required. Commercial banks and other credit sources are casting a critical and appraising eye as to the future of cow herd expansion in Nebraska. Related businesses, such as the beef packing industry, have been developed and relocated to meet the ever-changing needs of the industry. These changes cannot help but have a large economic impact on those areas which financial institutions are serving.

Nebraska's resources, its grass, crop residues, geographic location, transportation, natural water supply and meat packing industry are but some of the factors which invite greater beef production. The Nebraska cattle feeding industry, for example, finished for slaughter in 1972, slightly less than 4 million head of cattle. Approximately 60 percent of Nebraska's feeder cattle must be obtained from outstate sources. Greater competition for these sources of feeder cattle can result in a slowly diminishing supply. Hence, greater demands will be made on Nebraska's resources to meet the increasing feedlot needs. Consistent with the feedlot industry, vast amounts of feed grains are channeled out of Nebraska rather than used within the state. Basically, the entire beef industry of Nebraska depends on the one raw product . . . the beef calf.

Calves are the raw material which, when combined with other basic resources, eventually result in beef on the dinner table for the American consumer. Breeding herds require little grain or other expensive feeds. Although the cow must be considered an inefficient machine of beef production, she can remain competitive because of her ability to utilize a wide variety of feeds of both high and low quality. Beef production, to this point, is essentially a grazing enterprise, and the locations have been confined to semi-arid sparsely populated areas. There will be shifting of cow population centers as methods of beef production are increased in the Corn Belt areas.

Traditionally, calves produced under "range" conditions are either sold as calves or are held over and marketed off grass as long yearlings. Historically, steers or stocker cattle were held to two or three-year-olds, but as the demands shifted, and technology increased methods of production, cattle are reaching market at younger ages. With a reduction in land needed for these older cattle, more land has been made available for cow-calf production.

Farms in the grain producing areas of Nebraska may have grazing resources and are therefore adapted to cow herd operations. Technological advances in crop production have resulted in greater production and greater crop residues. Use of crop residue alternating with pasture grazing has resulted in additional nutritive resources. However, these beef production systems are secondary to crop production, and the cow herd becomes a by-product for using otherwise unmarketable products.

It has been said that the beef cow herd is about the only livestock enterprise that a man with little interest in, or poor livestock know-how, can afford to have. Beef cows can probably come closer to taking care of themselves and still produce a marketable product than any other kind of livestock.

Philosophically, this may be true, but such an approach to beef production would result in economic disaster at present day annual cow costs and methods of production.

The nature of the costs and investment in beef cow herd production systems pose special problems in financing. When feeding cattle, for example, cattle are purchased with 3 to 9 months needed to recover all or most of the total investment. Because of the long-time nature of the beef cow-calf production enterprise, recovery of initial investment is lengthened considerably. From the time a cow is bred, a minimum of 15 months is needed to realize any return from the sale of the calf. One calf crop does not usually repay the entire initial cost of the cow herd. Traditionally, financial institutions have preferred intermediate types of loans with repayments made over a 3 to 7-year period. The exceptions, of course, are situations where loans are well secured by collateral such as land.

To keep pace in modern beef production, farmers and ranchers need ever increasing amounts of capital resulting in greater amounts of borrowed capital. Agricultural credit is quickly becoming highly specialized, and is tailored to fit the specialized needs of the individual.

Farmers considering expansion of their existing operations to include a cow-calf operation and who exhibit management ability and economic stability will have little problem in acquiring capital for such expansion.

A method of financing cow herd expansion, which is receiving more attention, is with the use of non-agricultural investment capital. By the availability of such money, greater cow herd expansion in Nebraska may be realized. Basically, this method of expansion involves the placing of cattle with a farmer, for example, who has shown to have management ability and interest in managing a cow herd.

Obviously, the arrangements and terms of such an agreement are varied and should return the greatest profit to those involved commensurate with their resource investment. It is possible that such methods of providing capital may have as an end result a tax shelter motive.

The uncertainties of prices, feed, labor and investment cost make income from cow herds extremely variable, resulting in the need for flexibility in financing programs.

The objective of a beef cattle producer is to use available resources so that the return to the enterprise will pay all costs and leave a profit as large or larger than could be obtained from alternative uses of the same resources. Available resources such as land, labor and capital are usually limited, but can be acquired if a given individual is willing to work, pay the price involved and assume the risks which accompany such an enterprise investment.

From western Missouri to western Colorado and Wyoming and from Oklahoma to the northern boundary of Nebraska lies one of the richest cattle producing areas in the world. The Sandhills of Nebraska are highly suited to beef cattle production. However, the large farm areas can supply millions of tons of additional feed needed to support cow herd expansion. By anticipating the future beef needs of the American people, a large percentage of this need will be met by the state of Nebraska.

SECTION IV

FUTURE BEEF COW-CALF PRODUCTION IN NEBRASKA

Potential for Growth

Frank H. Baker

Nebraska's unprogrammed feed supply is attractive to cattle interests and financial institutions planning expansion or development of cattle feeding operations. One might assume that this feed supply could be the basis for attracting one-third of the new cattle feeding business in the United States of this decade to Nebraska. If so, the cattle feeding industry of the state would expand by 2.4 million head or to a total cattle feeding business of more than 6 million head for the year of 1980.

A question might be asked, "How large must Nebraska's cow herd be to produce 6 million feeder cattle for use in the feeding operations of 1980?" A cow herd of 6.7 million head would be required.

Producing and feeding 6 million feeder cattle and marketing three-fourths of a million cull cows in 1980 could result in a gross income of $2 billion (assuming a finished animal is worth $310 and a cull cow is worth $180). This is twice the level of Nebraska's gross receipts from the beef enterprises in 1970.

New investments during the next decade of about $100 million in new cattle feeding facilities and at least $500 million in working capital for cattle feeders is necessary to assure the added income from cattle feeding.

New investments of $2 billion in cows and working capital are needed for increasing the Nebraska cow herds to 6.7 million head. Additional investment in land and irrigation development may be necessary to assure the feed and forage supply for 6.7 million cows.

The feed supply for 6.7 million cows can originate in the following ways:

1. Development of irrigated pasture on 10 percent of the Sandhill acres (about 12 million acres in Sandhills). A 20-fold increase in feed produced on these acres is possible, based on research at North Platte. This irrigated pasture would provide feed for 2.8 million cows.

2. The stalks and other residues from 6.5 million acres of corn and grain sorghum can support 2 to 3 million cows.

With a current inventory of 2 million cow units, one can project to 6.7 million cows by indicating that Nebraska has forage resources for 4.7 new cow units. These exist in the potential of irrigated pasture, improved range management and the use of crop wastes on the farms of the state.

Nebraska can advance its economic development by choosing to use its feed grain and forage resources in feedlots and cow herds to produce $2 billion annually of beef income by 1980. This can be achieved through cow herds of 6.7 million head and feeding operations finishing 6 million cattle each year. A seemingly less desirable alternative is continued out-shipment of grain from the state.

SECTION IV

FUTURE BEEF COW-CALF PRODUCTION IN NEBRASKA

Feeder Cattle Replacements

Paul Q. Guyer

Nebraska has been one of the leading states in beef cattle production for many years. Yet during the 60's calf production has not kept pace with the rapid growth of beef feeding (Figure 1). Nebraska has moved in a few short years from having a surplus of feeder cattle to the position of having to import more feeders than are raised each year in the state. When heifer and bull replacements are accounted for, Nebraska must import about 2 million head of feeder cattle annually, or about 60 percent of our total feeder cattle needs. Figures 2 and 3 illustrate the number of calves born and cattle placed on grain feed in 1971, respectively.

To supply the additional feeders needed, cattle have been shipped in from both adjoining and distant states (Figure 4). With the growth of cattle feeding in Texas, Colorado, Kansas and Arizona, Nebraskans are looking to new areas to meet their feeder demands. Lines of feeder supply will tend to seek the shortest distance from origin to the feedlot. Feeder cattle will tend to move in the direction of slaughter and consumption with less "crazy quilt pattern" of movement than has been prevalent in recent years.

Shifts in the availability of feeders are emphasized by comparing data for 1966 and 1971 (Figures 5 and 6). Iowa, Nebraska, Colorado and Arizona continued to expand their cattle feeding industry and increase the magnitude of their deficit in feeder cattle numbers during this period. Texas and Kansas now feed more cattle than are available as feeders from their own yearly calf crop.

The second major change is the increased surplus of feeders from the southern and southeastern states. These are the result of increases in the calf crop produced and a sizeable reduction in number of calves slaughtered. A reduction in calf slaughter has also increased the availability of feeders in several of the states that have a high percentage of dairy cattle.

The present feeder cattle situation dictates that a number of deficit states must depend on cattle of southeastern origin more than in the past. Many of these may be grown on pastures in Texas, Kansas, and Oklahoma before reaching feedlots in Kansas, Nebraska, and Colorado as in the past. A predicted direction of feeder cattle movement in the 70's is shown in Figure 7.

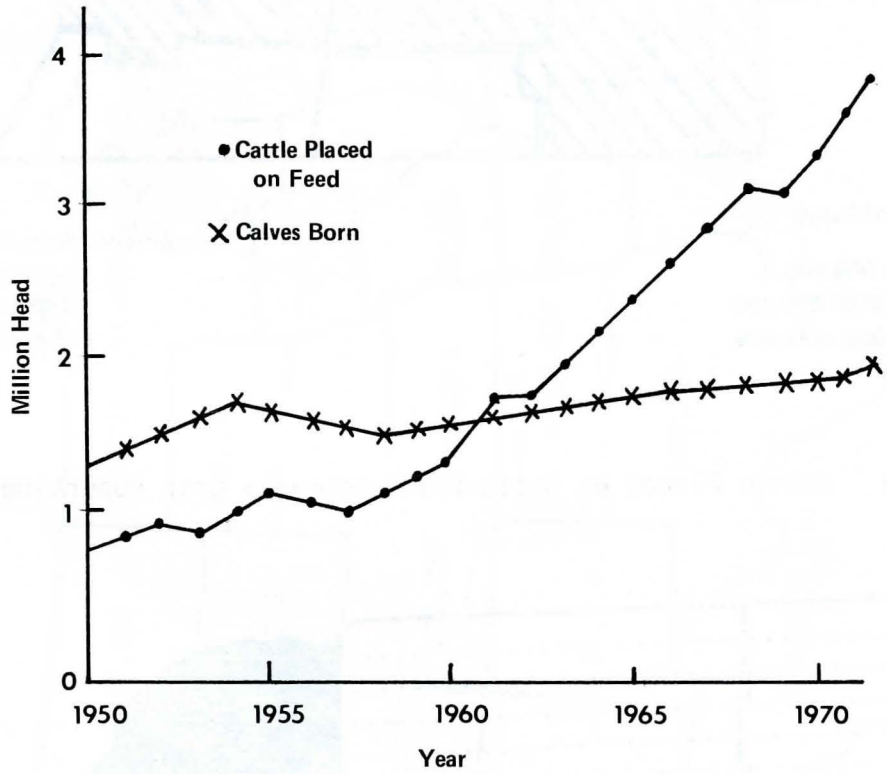
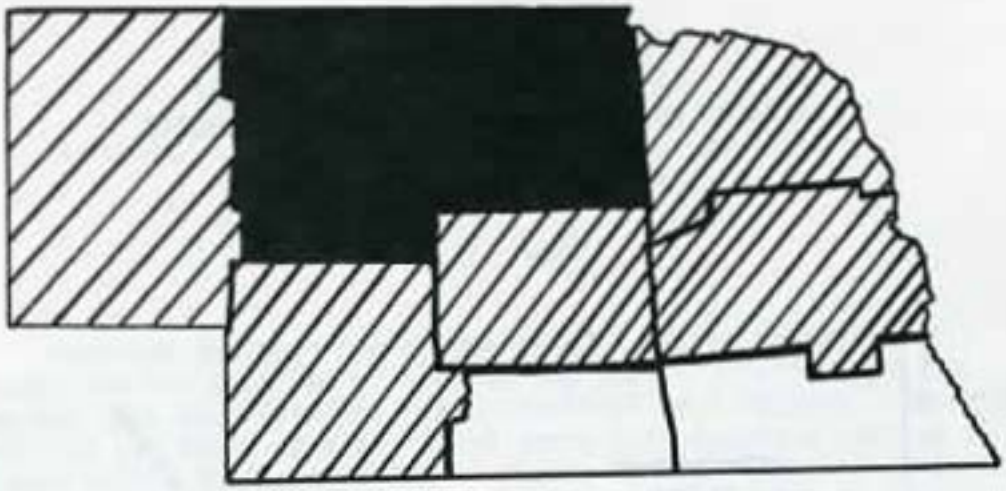


Figure 1. Cattle placed on feed versus calf crop produced in Nebraska.

Figure 2. Nebraska Calf Crop by Crop Reporting Districts, 1971.

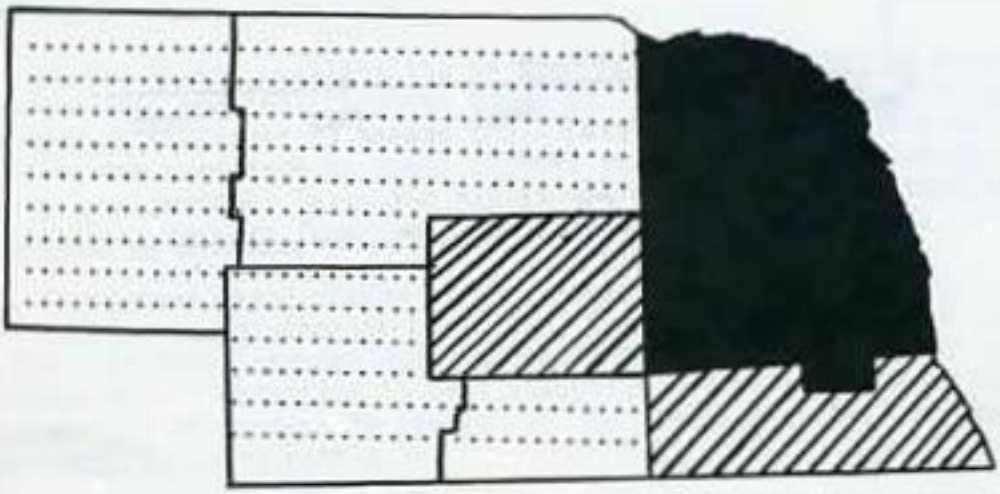


Number of Calves

Over 500,000
200,000 - 300,000
100,000 - 199,999

Source: State Federal Division of Agricultural Statistics, USDA-Nebraska Department of Agriculture

Figure 3. Cattle Placed on Grain Feed, Nebraska Crop Reporting Districts, 1971.



Head

over 1,000,000
300,000 - 500,000
100,000 - 299,999

Source: State-Federal Division of Agricultural Statistics, USDA-Nebraska Department of Agriculture

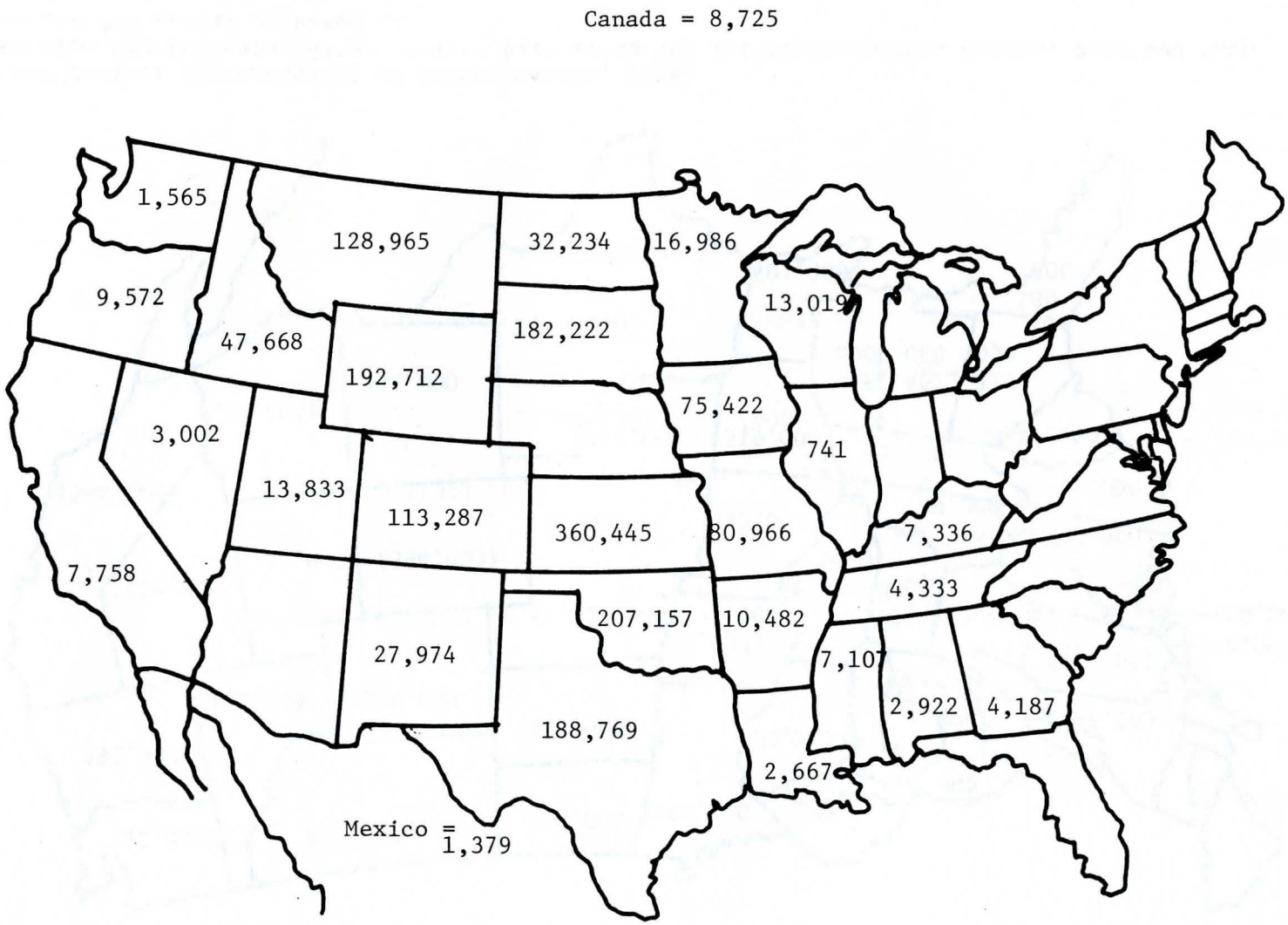


Figure 4. Inshipments into Nebraska by state of origin, 1968 (stockers, feeders and breeding cattle and calves shipped direct and from public stockyards).

Source: Nebraska Department of Agriculture .

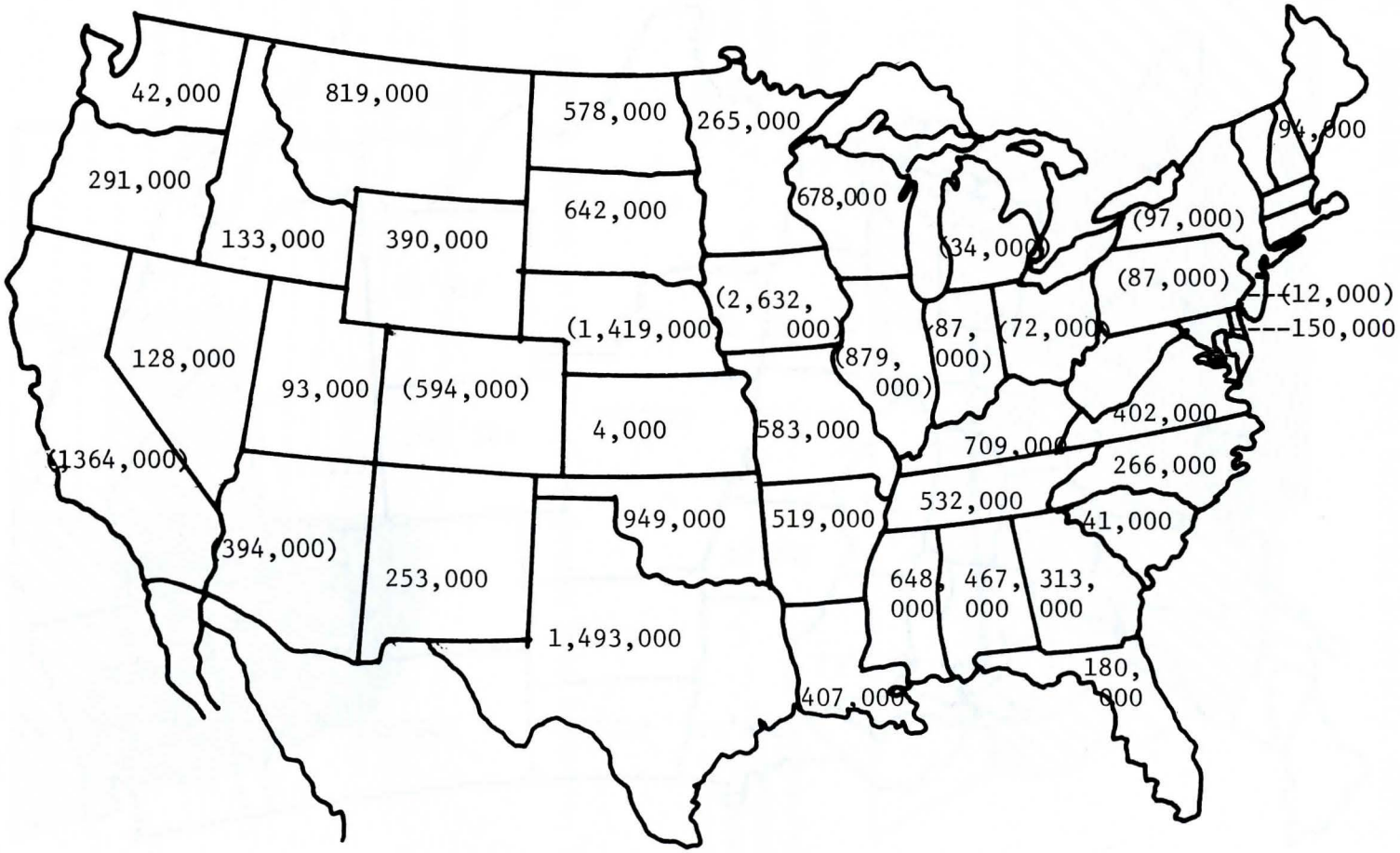


Figure 5. Surplus and deficit (parenthesis) of feeder cattle, 1966.
Estimated from the following data: Calves born minus 20% for replacements, deaths, calf and farm slaughter and fed cattle marketed .

Source: Livestock and Meat Statistics, U.S. Department of Agriculture.

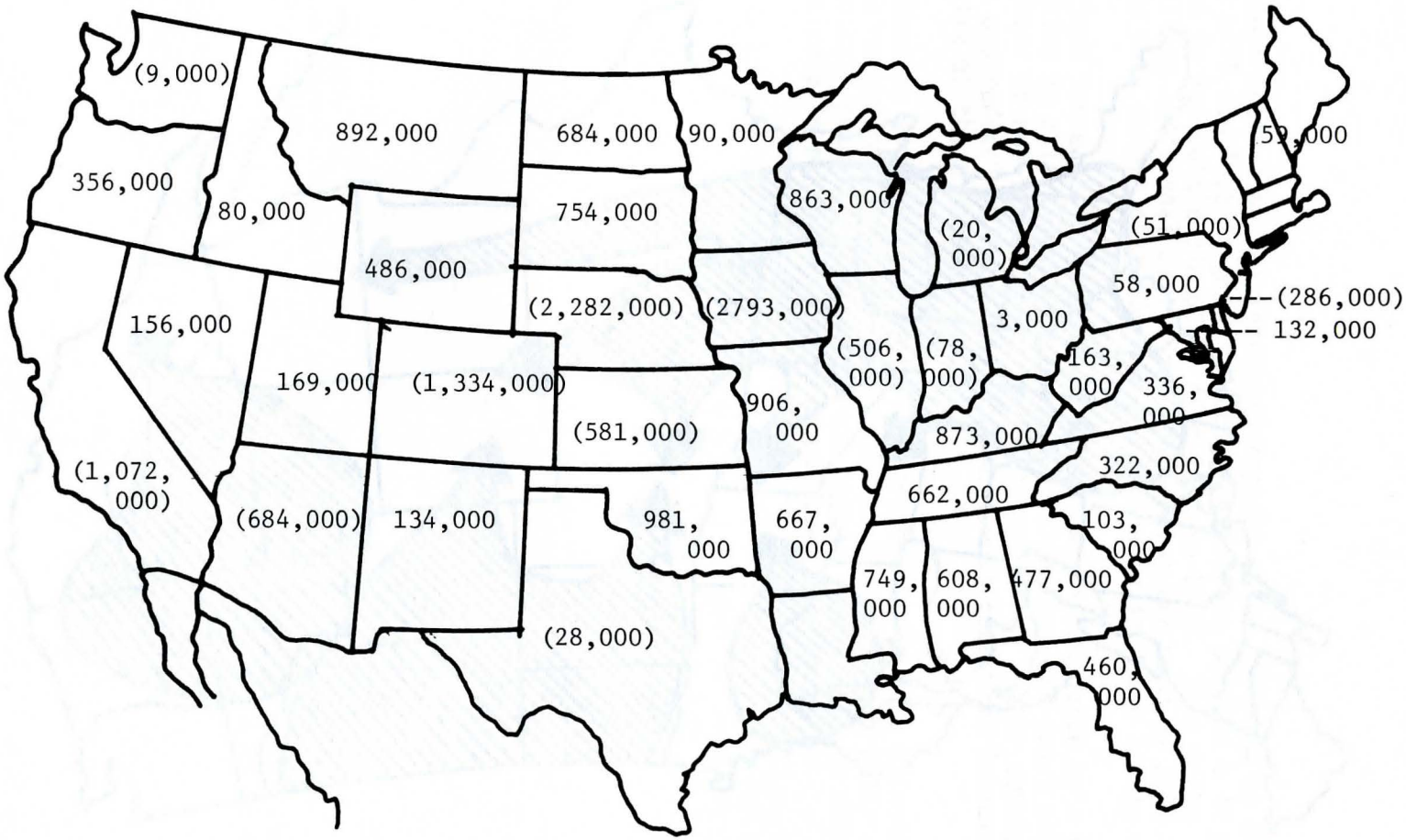


Figure 6. Surplus and Deficits (parenthesis) of feeder Cattle, 1971.
Estimated from the following data: Calves born minus 20% for replacements, deaths, calf and farm slaughter and fed cattle marketed .

Source: Livestock and Meat Statistics, U.S. Department of Agriculture.

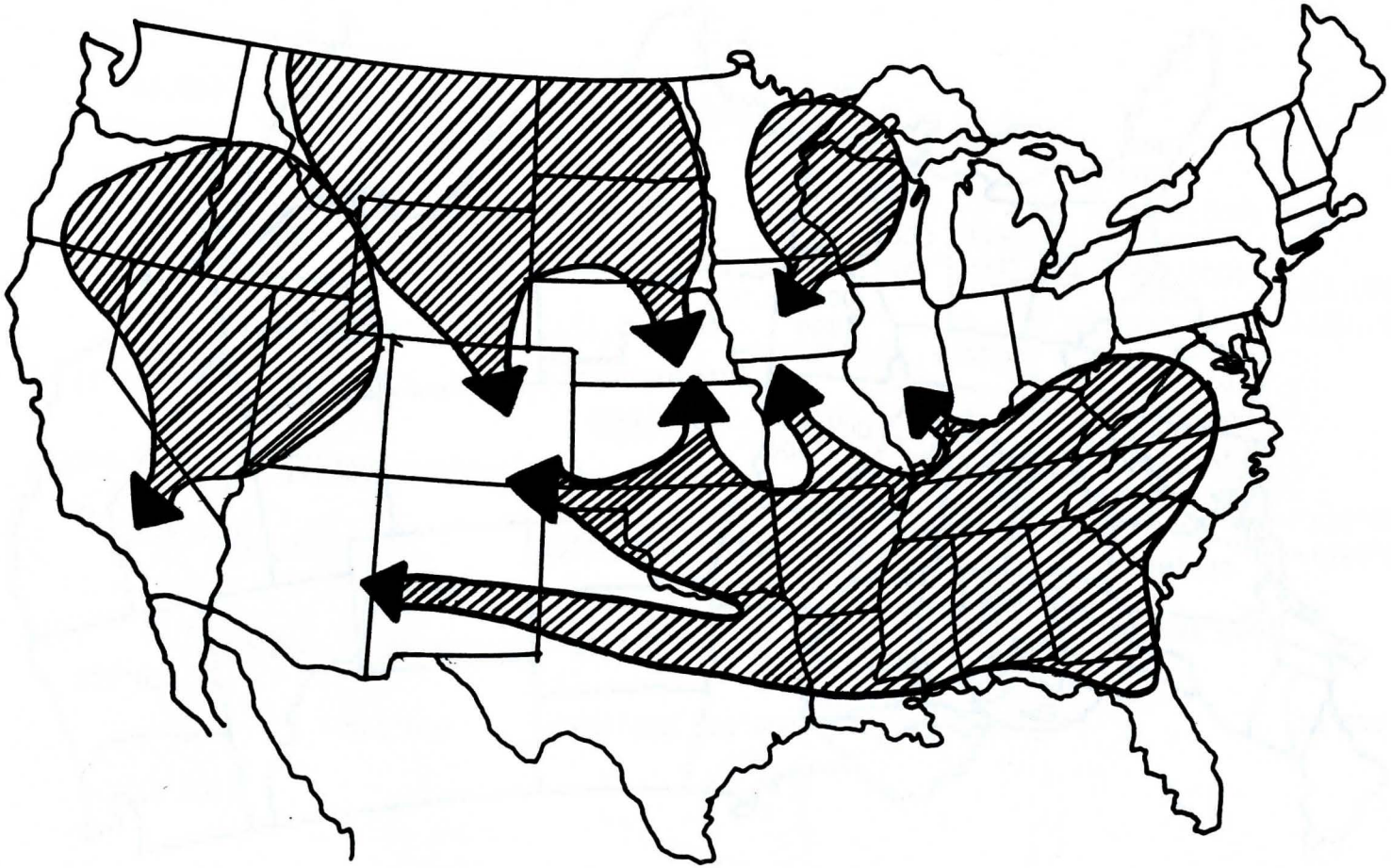


Figure 7. Directions of Feeder Cattle Movement in the 70's.

Source: Prepared from data used in Figures 6 and 7.

Beef production has increased rapidly since 1950 and by all appearances will continue to grow. Recent predictions project a 41 percent increase in fed cattle slaughter from 1970 to 1980. This means about 10 million additional cattle for the feedlot per year by 1980. To supply this number of feeders will require an increase in the cow herd.

Some increase in numbers of feeder cattle can occur by a further reduction in calf slaughter (now 3.5 million head per year) and slaughter of non-fed cattle. Some will come from higher conception rates and reduced calf losses. But most must come from increases in the size of the cow herd.

What is Nebraska's opportunity for sharing in this growth? We have a number of advantages that point to increased and profitable feeder calf production in the decade ahead. These will be discussed objectively in other parts of this publication.

SECTION IV

FUTURE BEEF COW-CALF PRODUCTION IN NEBRASKA

Irrigated Pastures

Donald C. Clanton and James D. Heldt

Irrigated pastures are becoming an increasingly important part of the beef cattle industry in the Great Plains region. Livestock producers have shown a renewed interest in irrigated pasture since the development of automated sprinkler irrigation and its application to sites not previously considered irrigable because of uneven topography and sandy soils. Many areas of rangeland can be converted to irrigated pasture resulting in an increased carrying capacity of approximately 20 times that of dryland range. This is one basic advantage of irrigated pasture.

A farmer may turn to irrigated pasture and a livestock program to improve farm income when cash crops are not rewarding. This use of irrigated pasture fits into growing or backgrounding programs. In addition to requiring livestock knowledge, operators who use this system need to be shrewd at buying and selling cattle in order to be successful.

Another basic use of irrigated pasture is to supplement or complement an on-going ranching situation. This type program, whereby ranchers complement the forage program in a cow-calf enterprise, has the primary concern of increasing efficiency of the reproductive performance of the cow herd and higher calf weaning weights.

In many ranching situations, green forage is not available during early spring for cows following calving and before the breeding season starts. Irrigated cool-season pastures provide green grass for several weeks before the warm-season grasses on native range are ready to use.

In general, there are many alternate uses that can be made of irrigated pasture in a ranching situation. Irrigated pasture can be useful in a range improvement program by eliminating the use of native range during spring and early summer.

In certain situations, some irrigated pasture and some irrigated corn may be desirable. In general, the irrigation potential that a rancher has can greatly increase his flexibility, his carrying capacity and possibly his returns.

Factors that need to be evaluated when considering irrigated pasture are:

1. Specific needs for irrigated pasture.
2. Suitability of soils.
3. Water availability.
4. Managerial ability.
5. Capital availability.

SECTION IV

FUTURE BEEF COW-CALF PRODUCTION IN NEBRASKA

Fall Calving

James D. Heldt

Fall calving may be started in a cow-calf program for one or more of the following reasons: to provide a marketing outlet at a different time of the year, more efficiently to use a forage program, and to make more efficient use of a specific labor-management need.

For those producers choosing to use fall calving, the breeding season management system also needs to be altered to fit the calving season program. Just as with spring calving, the goals should be a 100 percent conception rate and a 95 percent calf crop at weaning or marketing. Both of these goals should be achieved with the use of a short breeding season, preferably 60 days. The cow herd that obtains these levels of management, with either fall or spring calving, will show a calf-crop profit that parallels the level of management.

In general, fall calves are weaned at the time of year when prices received for feeders are higher. In the years when this is true, the calf-profit picture is brighter. The marketing alternative at this time of year may fit well into the cash flow of an operation that normally may have a more restricted cash income. This factor would apply to only those operations that were selling calves as feeders. It would not apply to operations that placed their calves in their own or a custom feedlot.

The availability of forage is another factor to consider in making a decision between fall and spring calving. Fall calving may be an important management consideration for those producers considering or presently using an irrigated pasture system. The cow herd needs to be fed properly in order to maintain the proper level of reproduction. Possibly, some stored feed may need to be used in a fall calving program.

A few other factors that are advantages of fall calving are the decreased heat and insect stress affecting the calf and the confinement of the cows in winter enables closer monitoring of the breeding season when there is generally greater labor available. The labor situation would also allow for closer attention to be paid to the cows and calves.

SECTION IV

FUTURE BEEF COW-CALF PRODUCTION IN NEBRASKA

Crop Residue Utilization

John K. Ward

Nebraska harvested 5.2 million acres of corn and 1.8 million acres of sorghum for grain in 1972. Crop residue left in the field from these crops is a valuable winter feed for beef cows and can either be grazed or harvested for use as emergency winter feed for drylot feeding. In addition, harvested crop residue may be used as feed for a summer cow-calf program. Yield per acre of harvested crop residue will vary considerably due to the type of crop and crop year, but would normally range from 1-2 tons of dry matter per acre.

Corn and milo stalks could furnish enough roughage to keep Nebraska's 2 million beef cows on a year around basis if weather permitted.

Methods of using crop residues include field grazing or harvesting forage through the use of bunching wagons pulled behind the combine or flail wagons used after grain harvest. The critical factor in harvesting these products is to keep costs low enough to be competitive with other feedstuffs and to use them properly.

The product is slightly deficient in protein for dry, pregnant, mature cows, but adequate in energy. Lactating cows on crop residues will need protein and energy supplementation. Cows also must be fed supplemental vitamin A and minerals particularly phosphorus.

SECTION IV

FUTURE BEEF COW-CALF PRODUCTION IN NEBRASKA

Artificial Insemination (AI) In Beef Cattle

Earl F. Ellington

ADVANTAGES OF ARTIFICIAL INSEMINATION

Artificial insemination is one of the most valuable procedures ever developed for the genetic improvement of farm animals and beef cattle are no exception in this regard. Many of our present beef cattle are unprofitable or not as profitable as they could be because they are not rapid, efficient producers of desired carcasses. Yet many growth and carcass traits are relatively high in heritability, which means that the beef producer who bases selection of breeding stock on records of performance can greatly increase the return on his investment.

The greatest advantage of A.I. is the opportunity to spread superior genetic material through the widespread use of carefully tested and selected sires. One good proven bull can sire, through A.I., from 10,000 to 15,000 calves a season instead of the usual 25 to 50 through natural services. A.I. provides a means of reducing the incidence of various diseases, particularly the venereal diseases spread by sexual contact. A.I. has provided for more complete and accurate breeding records, which has led to better herd management. It eliminates the expense and problems associated with maintaining bulls.

When A.I. is properly done, the disadvantages are few. For the most part, the disadvantages or problems are actually "people ones" and can be overcome by better management. For example, the technicians involved must be sufficiently trained and the producer must exercise proper management to maximize success to A.I. The following discussion will deal with points over which the producer has control and to which attention must be given if A.I. is to work best. The points relate to some of the more frequently observed difficulties and the discussion of each one is by no means considered very comprehensive. Those interested in starting an A.I. program are encouraged to visit with their county extension agent for additional information.

MAKING A.I. WORK

Attitudes

A most important factor contributing to the success of A.I. is the

attitude of the producer. If the producer's attitude is negative because of certain doubts or reservations, chances are high that the procedure will fail for him. Halfway approaches will always lead to disappointing results. For A.I. to contribute to the success of an operation, the producer must be willing to see that the remaining points are given appropriate attention.

Heifers Should be Adequately Developed

A convenient measure that reflects development of the heifer is body weight. Heifers of the standard beef breeds should weigh at least 600-650 pounds at the time of breeding. Attempting to breed earlier can be disappointing because low percentages will be cycling. Even if breeding is accomplished in some females at the earlier time, the conception rate will most likely be poor. Animals that do conceive can be prone to calving problems.

Allow Time After Calving

For maximum production of calves, it is important that cows not remain open for prolonged periods. However, a recovery period of 60-75 days after calving is needed before breeding is attempted. This interval allows time for the reproductive system to recover from pregnancy and the birth of the calf, and still makes possible meeting the goal of a calf each 12 months. Breeding earlier than the recommended interval will result in lowered conception, and even when conception does occur, it is more likely to end in abortion. Such terminations lower the chances of conception at subsequent breedings and result in prolonged breeding periods.

Heat Checking and Proper Breeding Time

The cow is typically in estrus (heat) for 16-18 hours each 20-22 days. She ovulates (releases the egg) at about 12 hours post-estrus. A number of events must occur from the time of semen deposition in the cow's reproductive tract to the time of fertilization. In any case, the best conceptions will result if insemination occurs during a period covering the last 8-10 hours of standing estrus and a few hours thereafter. The rule of breeding cattle first noticed in estrus in the morning, during the afternoon of that day, and breeding those first noticed in estrus in the afternoon, during the following morning, works well to locate the best conception time for most cows.

All of this points to the importance of doing a good job of heat detection if maximum conception rates are to be accomplished. The cattle should be observed at least twice daily (early morning and late afternoon) for signs of estrus. The most dependable sign is, of course, standing for mounting. In all too many cases, what we may regard as a "silent heat" is really a missed heat because of a lack of close

and careful observations. Use of sterilized bulls or hormone treated steers can facilitate heat checking.

Proper Nutritional Program

Inadequate feeding can cause serious fertility problems. Nutritional factors such as energy, protein, vitamin A and phosphorus have definite roles in reproductive processes. One of the most common nutritional reproductive problems results from an inadequate supply of energy or underfeeding. This seriously delays sexual maturity in heifers and impairs fertility in cows. Even though some controversy exists concerning the association of overfeeding with infertility, the results of most studies would support the concept that overfeeding also can lead to reproductive problems.

Proper Handling Procedures

Any mistreatment or excitement that disturbs the general well being of cows can lead to difficulty in accomplishing conception. "Common-sense" procedures that minimize excitement are important in the handling of cattle, particularly range cattle, if an A.I. program is to be successful. Other management activities which involve manipulating the cattle should be kept at a minimum during the breeding period.

Breeding Facilities

Breeding pastures should be of size that provide ample feed during the breeding season, but yet not so large that the cows cannot readily be observed. Rotational systems to use smaller pastures is advisable. Corrals should be strategically located, preferably near the water supply, to contribute to the convenience of bringing cattle in for insemination. Chutes of width and length for holding individual cows are essential. Use of squeeze chutes and other methods of physical restraint should be discouraged.

Future

A.I. has worked well in beef cattle when appropriate attention has been given to the points reviewed. Fortunately, the technology of semen collection, processing, storage and insemination have already been developed and tested in dairy programs and can be used equally well with beef cattle.

A procedure that would allow artificial insemination to become more practical and convenient with beef cattle is that of controlled or synchronized breeding. This procedure, if developed to its fullest extent, would allow inseminations to be made at prescheduled times without

the laborious task of heat checking. Procedures that offer the most promise in this regard are those based on the use of hormones called progestogens. A significant problem has been the tendency for lowered conception at the controlled breeding time.

Present research is directed toward the development of procedures to overcome the present problems so that a method(s) can be recommended. In addition to studies of this type, emphasis in University of Nebraska research programs is being given to the development of procedures that would not only control the time of breeding but the rate of ovulation which would lead to an increase in the frequency of twinning.

The beef producers of the future will, if present trends in population growth and beef popularity continue, have to provide increasing amounts of beef. This will have to be accomplished in spite of (1) increasing land costs (2) labor shortages (3) increasing feed grain costs and (4) competition for land with recreational and "developmental" interests. In order for the producer to meet the demands for beef, to remain competitive and to receive a fair return on his investment, there will, no doubt, be increased use of A.I. and other, perhaps yet not perfected, technological procedures.

SECTION IV

FUTURE BEEF COW-CALF PRODUCTION IN NEBRASKA

Drylot Cow-Calf Production

James D. Heldt

Although the concept of confinement is not new, the use of confinement production as a management technique in beef cow-calf production is new. In recent years the Corn Belt, including Nebraska, has seen confinement cow-calf production and various modifications of it come into use as a unique management system.

Cowmen, especially those in the range areas, have relied upon the native grasses, improved pastures and other types of available forage to maintain their cow herds. Recently, with increased irrigation for corn or pasture production or both, along with increasing land costs, certain cattlemen have made an effort to more intensively use the land available for cow-calf operations in many areas.

One of the major advantages of drylotting is the opportunity for increasing herd size without obtaining more land. Drylot confinement of a number of cows allows superior management to be imposed over many units of production: reproduction, genetics, nutrition and herd health.

Research studies indicate that conception rate, percent calf crop weaned and calf weaning weight are at least as good in drylot confinement cow herds as on native pasture. Fewer services per conception are required in drylot vs. pasture.

Drylotting also lends itself to easier handling of A.I. and fall calving, if desired. Both of these management schemes are discussed in more detail elsewhere in this publication. Reproductive technological techniques such as A.I., estrus control and calving at various times of the year are more conceivable with confinement of cows.

Improved genetic and breeding methods are possible with drylotting. Individual identification and performance records can be more easily obtained. Therefore, selection and culling may be more accurately and meaningfully applied in the herd to enable more rapid genetic progress.

Nutrition of the beef cow may also be improved. More exact nutrient intake can be established and the cow can be fed according to her particular needs. Labor needs may be somewhat higher in confinement than in pasture. However, the labor needs of the feeding enterprise are lower in confinement. One of the keys to successful feeding of the confined cow herd is a

readily available source of forage. A cheap source of silage is a great benefit to feeding the confined cow herd. Most research studies indicate a slightly higher annual feed bill for a totally confined cow-calf production system when compared to a pasture system. By being able to maintain a closer watch over cows, feed savings can occur. Feed saved on dry cows could be applied to creep feeding of calves.

Herd health can be better controlled by more prompt treatment of sicknesses and health problems. However, the operator must exert keen herd health management as disease seems to become more of a problem whenever animals are in a confined environment.

One major advantage of either total or partial drylot cow-calf production is that it allows the opportunity to maximize feed production per acre of land. At the same time, it provides the small producer the opportunity to increase the size of his cow herd without increasing his investment in land. The cow herd can be raised under a total drylot program with no grazing at any time of the year. Other alternatives are partial dry-lot maintenance programs with some part-time pasture grazing to harvest grass nutrients at the time of their peak quality. A pasture program can be supplemented with drylot feeding especially during the time when grass quality is poor. A drylot maintenance program might be supplemented with gleaning corn stalks or other crop residues.

Drylot cow-calf production is a management system requiring close supervision of the herd and a greater labor input. However, where an operator is restricted in land he could raise more beef cows with this management system for less land per animal unit and possibly make a more balanced and complete use of his forage supply.

SECTION V

SUMMARY

Keith E. Gilster

Per capita beef consumption in the United States increased from 63 pounds in 1950 to 114 pounds in 1971. Greater supplies of beef will be needed to meet the demands as the population and individual consumption increases.

It is estimated that 2,160,000 calves were born in Nebraska in 1972. However, during this same year, an estimated 3,990,000 cattle were marketed for slaughter in Nebraska. In 1972 Nebraska cattle feeders marketed about twice as many cattle as there were calves born within the state, assuming some calf death loss.

Nebraska has the necessary resources for expansion of the cow-calf industry. Approximately 48 million acres of farm and ranch land exist in Nebraska of which about 50 percent is native grassland. The native grasslands within the state have produced an excellent supply of feeder cattle in the past. Through increased grass production by irrigation, fertilizers and other methods, even greater cow-calf production is feasible in this great cattle producing area.

The greatest opportunity for an increase in cow-calf production exists, however, through the use of crop residues. Nebraska farmers harvested 5.2 million acres of corn and 1.8 million acres of sorghum for grain in 1972. Crop residues from these two crops could furnish enough roughage for Nebraska's 2 million beef cows on a year around basis if weather permitted. Of course, proper mineral, vitamin, protein and possibly energy supplementation would be necessary depending mainly on the amount and type of feedstuffs consumed and the stage of production of the beef female.

Water is a tremendous asset of Nebraska. Wise and efficient use of irrigation water can increase Nebraska's roughage and grain production tremendously.

If Nebraska's cow-calf industry is to develop on a sound, healthy and profitable economic foundation, cow-calf producers must be knowledgeable in cow-calf herd nutrition, genetics, health, management, reproduction, economics, marketing, etc. These are important areas concerning a successful cow-calf industry.