

## OZARK BEEF COW-CALF PROGRAM COMMITTEES

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# Foreword

The rolling hills of the Ozarks comprise one of Missouri's most scenic and valuable resources. Because the terrain is rugged and the soil shallow, a large percentage of the area is in grass and legumes. Such conditions spell cow country.

The cow, with huge capacity for a wide range of forage plants, can convert otherwise unmerchantable roughages into needed milk and meat.

Cattle came to this area with the first settlers. They do their job to the best of their ability in spite of the fact that man hasn't done the best job of providing them with optimum conditions. This Ozark Beef Cow-Calf Program came into being because there is a great opportunity to increase net returns simply by making conditions more favorable for the beef cow.

Let's take a look at conditions in the Ozark cow country as they are now.

This 44-county area contains more than 11 million acres, of which two million acres are in crop land and one million acres in forest land which is not pastured. The remaining eight million acres are used by the 575,000 beef and 275,000 dairy cows and their offspring.

Five million acres of the eight million are designated as best suited for grazing and hay production. Only 20 percent (1 million acres) has been renovated to date so that it is producing satisfactorily.

It is evident from this that we are not providing the conditions for the beef cow to do the job she can do. Further, only 82 percent of the cows calve per year. This indicates the cow's health, nutrition and management are being neglected. The calf crop should be above 90 percent instead of around 82.

At market time the calves that are produced weigh less than 400 pounds. Between this and the low percentage calf crop, our Ozark cows are, at best, averaging less than 300 pounds of calf sold per cow.

We are handicapped, too, when we sell our cattle. Too many low quality cattle are included in our marketings simply because we frequently fail to select our best replacement heifers and buy desirable bulls.

Failure to dehorn and castrate and follow simple but sound health programs further robs us of income.

Gross sales from an estimated \$400 million investment in our beef cow business were less than \$40 million in 1967. This means only one dollar return was obtained for each \$10 invested—to pay interest on our investment, buy equipment, feed and supplies, and leave something for the family to live on.

These were the facts that brought together more than 100 people to make this study and develop a program, a do it ourselves program that can realistically triple our income.

The idea for the program had its beginning when one of our Extension livestock specialists kept running into discontent with these conditions as he worked with cattlemen and businessmen connected with the Ozark beef industry. As discussion broadened, Elmer Kiehl, dean of the University's College of Agriculture was asked to invite leaders from the area together to see what could be done.

This group met at Lebanon, June 28, 1968. From this meeting came the spark needed and a decision that a study would be made and a program planned to improve the industry. It was to be a program developed by the industry. Six major areas of study were selected:

- Beef Cow Economics in the Ozarks
- Improved Breeding and Performance
- Feeds and Forages
- Herd Health
- Management
- Marketing

Committee members were selected for their ability to contribute to the study. These members came from throughout the 44-county area. Included were beef cattle producers; businessmen who handle services, supplies, and credit for cattlemen; veterinarians; cattle market men; and educators.

This publication gives the reports of these committees. The reports are the basis for a sound beef cattle program in the Ozarks.

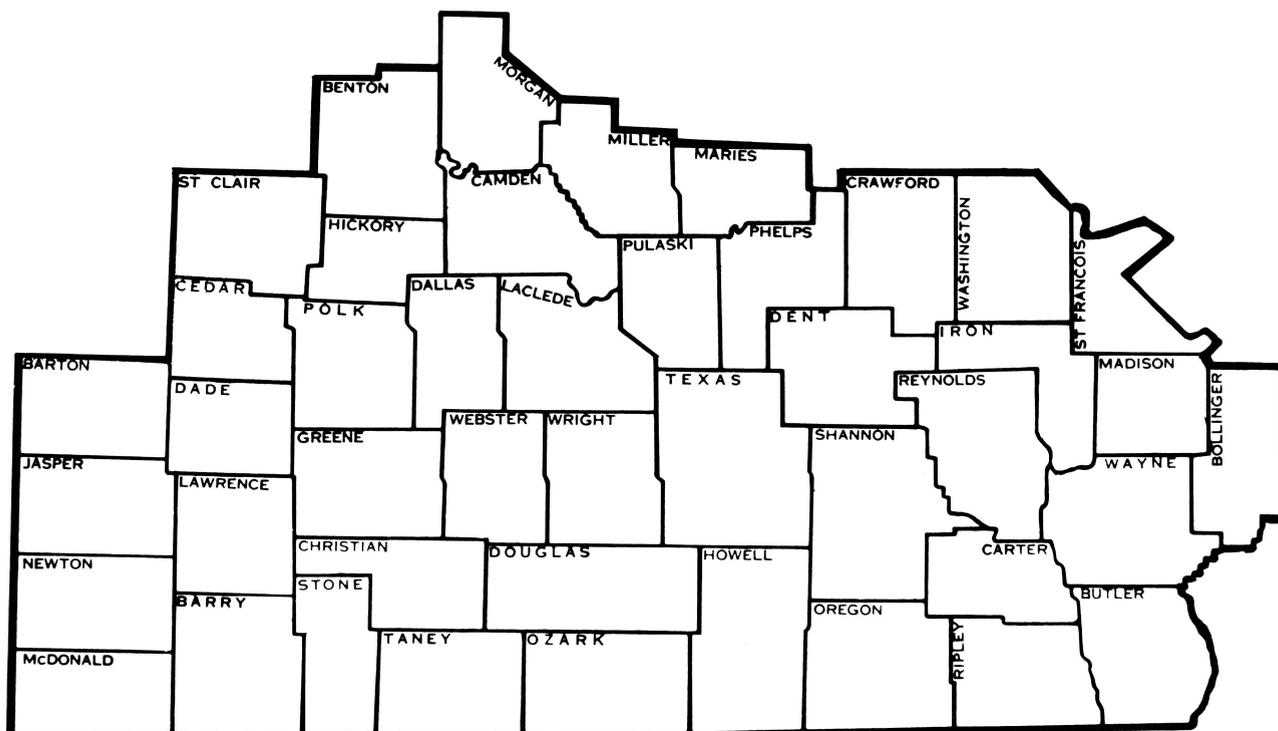
The committees established the following seven goals as major objectives to reach by 1980.

1. Produce a 95% calf crop each 12 months.
2. Calves to average 450-500 lbs. and grade choice.
3. Calving period 60-90 days, in early spring (January-March) or fall (September-November).
4. Healthy herds, free of diseases and parasites.
5. Feed costs kept at a minimum consistent with profitable production through a planned forage program.
6. Production records kept as a tool for selection, and production cost-income records as a means of evaluating and improving your beef enterprise.

7. Study carefully the many marketing outlets, and market through the one that offers greatest advantages.

Every person who has a sincere interest in the beef business has an opportunity to help reach these targets and put the Ozarks on the beef cow map. It is time to make the beef cow do what she is capable of doing for this section of Missouri. This is an industry-wide plan and it is up to the different segments to contribute the part they can do best. The result will benefit all of us—from farmer to market man and supplier—in fact the economic progress of the whole Ozark region.

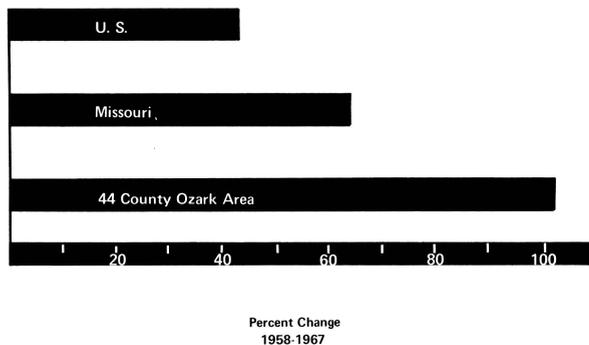
*Joe Ewing  
Chairman*



**THE 44 COUNTIES COOPERATING IN THE OZARK BEEF COW-CALF PROGRAM**

# OZARK BEEF COW-CALF PROGRAM

RATE OF INCREASE (%) IN BEEF COWS 2 YRS. & OLDER, 1958 TO 1967



## Beef Cow Economics in the Ozarks

### Situation and Trends

Gross income from beef production in the 44-county Ozark Area is estimated at 35 to 50 million dollars annually. This is an important part of the area's economy.

Our beef industry is a growing one, too. Numbers of mature beef cows rose from 283,572 in 1958 to 571,562 in 1967 for a 102 percent increase. The increase in the remainder of the state was only 64 percent.

The majority of the cattle produced here are shipped to other areas to be finished.

Net income per cow in the area is too low. That is to say that total costs per cow are too great compared to gross income per cow. Factors that affect production costs include increasing land costs, taxation and other fixed costs, and high wintering costs. Gross income per cow is affected by light sale weights, low calving percentages, and sale prices as related to grade and prevailing cattle market.

There is confusion about what is an economically feasible beef cow enterprise. Family objectives for their beef cow herd may be divided into three categories.

1. *The family is depending on the beef herd as the sole source of income.*

2. *The family is depending on the cow herd for a portion of the total farm income and has other farm enterprises such as feeder pigs or poultry.*

3. *The family is depending on the cow herd for a portion of the total income and has outside sources of income such as off-farm employment, or retirement income.*

In situations 2 and 3 above the beef cow may be performing a salvage role. A herd may be economically feasible in a role such as this but not in another.

Capital and operating costs are rising faster than prices received for the product; namely, the feeder calf and cull cow.

There is a need for greater understanding of financing the beef-cow operation by both producers and financial institutions.

Capital investments on many farms are too high in relation to income per \$1,000 investment.

Producers know too little about the economy of their operation.



*Ozark beef cow numbers increase 102 percent from 1958 to 1967.*

### **Problems and Solutions**

*1. Too many beef producers are unaware of the costs and returns of their production. This is vital for credit determination and operation improvement.*

Solution to this problem includes these two efforts:

A. Keep production records such as those used in production testing programs; i.e. cow-calf identification, calf birth date, adjusted 205-day weights and sale weights and value.

B. Keep a cost record which includes all costs of the beef herd and any other costs of which a portion should be charged to the beef herd.

*2. A full line of credit is difficult to obtain from a single credit institution.*

To solve this problem, the committee suggests:

A. That seminars be held with credit institutions and beef producers to determine the feasibility of long-term, full-line credit for well managed beef

cow herds. The desired results would be a credit program of long-term, intermediate, and short-term credit engineered to meet the needs of cattlemen and accepted by bank examiners.

B. A simple form should be developed that would contain the information necessary to set up a sound credit program. It should include:

- (1) A complete and accurate financial statement,
- (2) Profit and Loss Statement,
- (3) A monthly cash flow statement,

*3. Many people get into the cattle business without an understanding of the business or the cattle production capabilities of their farm.*

The solution is largely up to the individual producer, who can take the following steps:

A. Take advantage of all experience and information available. Visit credit people, particularly agricultural representatives. Visit an Agricultural Extension agent and state and federal agricultural agencies, and outstanding commercial and purebred cattlemen.

B. Get the opinion of neighbors and farm advisers as to what the present carrying capacity of a farm is and the estimated potential.

*4. The capital investment per cow is too great on many farms to be economically sound. The Committee feels that \$800 should be the maximum and \$600 is more realistic.*

Solutions:

A. Study carefully the economics of increasing the carrying capacity of a given acreage through basic pasture improvement and annual top-dressing. On some farms, brush spraying may be profitable if the timber production potential is low.

B. Keep machinery investments low. The use of custom work instead of buying expensive machinery that is usable only for short times is desirable. Labor saving equipment should be purchased only when the labor can be used profitably elsewhere or if age or health is a factor.

C. It is easy to get too much invested in buildings. Shelter is not needed for healthy cows and calves. A "sick pen" with shelter may be advisable. Hay storage may be provided in existing buildings.

*On most Ozark beef farms timber and hills will furnish adequate winter protection.*



New construction should be pole-type because of low cost and convenience.

*5. The cost-return ratio is too narrow on many Ozark beef farms.*

Solutions include the following:

A. Apply proven production practices as outlined elsewhere in this report if you expect reasonable financial returns for your inputs. Marketing above 400 pounds of choice calf per cow each 12 months is basic to success.

B. Keep production costs to a minimum consistent with production. Feed costs represent about 70 percent of production costs. Look here, especially, for profit seepage. Wintering costs may be too high. Wise fescue management as outlined in the Feeds and Forage section can greatly reduce wintering costs. Expensive feeds are not needed for beef cows and cannot be justified. Overfeeding and underfeeding are both expensive. Supplementation of home grown feeds must be on basis of need. Calculate what is needed and buy no more—and buy at the lowest price.

*Credit institutions can better help you with your financial needs when you have adequate records.*



# Improved Breeding and Performance



## Situation and Trends

Quality of the beef cattle produced in the 44 Ozark counties varies greatly. One reason is that many of the producers have small herds and do not expect them to provide much income.

Fifty percent of the beef cow herd owners in the 44 counties classify in the "low income" category. Their herds generally number less than 20 cows. While herd improvement can bring an impressive percentage increase in these producers' beef cow income, the actual money increase would not be large. Thus, the incentive to improve small herds is not as great as the incentive to improve the large ones. Increasing herd capacity of farms through improved pastures, expanded acreage, and other means would likely help quality indirectly.

The kind of cattle the producers of breeding cattle maintain in an area has a big influence on the kind of cattle commercial herd owners of surrounding neighborhoods turn out. This is particularly true of the small herd owners because they buy most of their herd stock locally. Consequently, work on the quality of cattle developed by the breeding cattle producers of our area is bound to help improve overall quality.

Only between 1 and 2 percent of the herds are now using performance tested bulls. Few herd owners

are seeking out improved genetic material for herd improvement. There is a shortage of bulls that will give the improvement desired.

One of the biggest detriments to income from herds of the area now is the low percentage calf crop—only 82 percent. Average weaning weights, which range between 375 and 400 pounds, are too low.

The calf crop of the area is dispersed throughout the year. This presents problems in trying to assemble uniform lots for feeding and marketing.

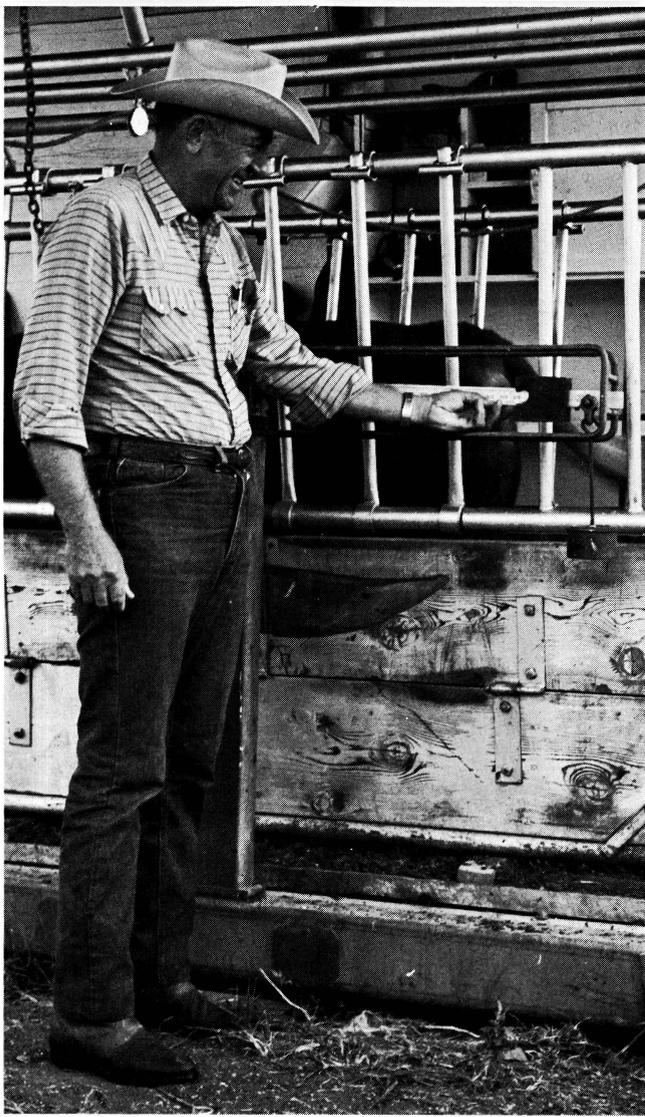
Following is a list of the eight main goals set by this Ozark Beef Cow-Calf Committee. Problems blocking achievement of each goal and recommendations for conquering these problems are discussed.

## Goals, Problems, and Recommendations

*Goal 1—Instill in all beef cow herd owners an awareness of financial benefits from improved breeding and performance.*

This goal involves a problem in communication and education. Solutions recommended by the committee are:

- a. *Agencies related to the beef industry and the University Extension Division, together, locate at least one innovative beef cow herd owner, purebred or commercial, per township to enroll in a beef cattle performance testing program.*



***Don't guess; weigh! Performance testing is one of the keys to improvement of the Ozark beef industry.***

These herds can be used for demonstrations. Data from both good and inferior stock should be obtained and used for educational purposes.

*b. Establish one or more feedlots in the 44-county area equipped with record keeping services for consigners.*

Individual producers' cattle would be fed and evaluated for rate and efficiency of gain and carcass merit. Objective is to provide data for producers to use in breeding and selection programs. The feedlot(s) can be cooperatively or commercially owned.

*c. Inform personnel of banks, PCA, FHA, and other lending agencies of the financial value of performance testing.*

***Goal 2—Produce a 95 percent crop of calves each year averaging 500 pounds.***

Problems preventing us from achieving this goal include unproductive cows, feeding of unbalanced

rations, lack of attention to performance records, diseases, and inadequate sanitation. Recommendations for overcoming these problems are:

*a. Eliminate unproductive cows.*

Market cows showing two unproductive years. Pregnancy check exposed females at weaning. Remove open females from the herd. Breed replacement heifers 30 days ahead of the cow herd. Sell heifers that do not breed within 90 days.

*b. Provide adequate energy, protein, minerals, vitamins, and water so the cow herd can cycle, settle, and lactate annually. Allow one-third to one-half pasture or hay carryover as insurance against bad weather.*

*c. Select replacement heifers on basis of performance records.*

Place emphasis on weaning weights of the heifer and her dam's previous calves. Place equal emphasis on performance and conformation.

*d. Encourage owners of herds with average or better performance to raise their own replacements.*

Bulls with suitable records will continue to upgrade these herds. Disease and health problems will be fewer than if they bring in animals from outside.

*e. Urge producers to buy in quantity from a herd owner who is doing performance testing when they do purchase replacements.*

Base choices on performance records. Also buy from herds where high levels of health and sanitation are maintained.

*f. Encourage some cattlemen to evaluate opportunities of producing crossbred female replacements.*

Urge them, however, to maintain record of ancestry and furnish these records to purchasers. There is need for an association or group to keep F<sub>1</sub> cross certificates of registration.

***Goal 3—Have 75 percent of the calves of the area sired by performance tested sires that meet recommended standards.***

Progress toward this goal will be hampered by shortage of bulls having superior quality and growing ability. Suggestions for solving this difficulty are:

*a. Each county prepare a list of bulls in the area which have been tested and which meet recommended standards. Publish a compilation for the 44-county area.*

*b. See that bulls that have proven to be excellent breeders are not sold for slaughter after two calf crops but are made available to other purebred or commercial breeders.*

- c. *In cooperation with the Missouri Beef Cattle Improvement Assn., establish one or more all-breed performance-tested bull sales in the area.*
- d. *Prove young bulls by breeding them to a minimum of 15 identified females of known producing ability.*
- e. *Familiarize breeders with tools such as scales, sonar, K-40 counter, and photogrammetry to determine the value of their herd sires.*

**Goal 4—Fifty percent of the cow herd owners basing replacement of females on performance records by 1980.**

Methods suggested for achieving this goal are:

- a. *Promote production record keeping by all herd owners.*

Banks, associations, agencies, and educators can all assist with this effort. Printed aids and record keeping services might be a part of the assistance.

- b. *Hold occasional record keeping meetings or short courses.*

**Goal 5—Have cows grouped for January through March 15 or September 15 through November calving. (See calendar, Management section.)**

This is largely a bull management problem. A planned educational program is needed to get the following recommendations adopted:

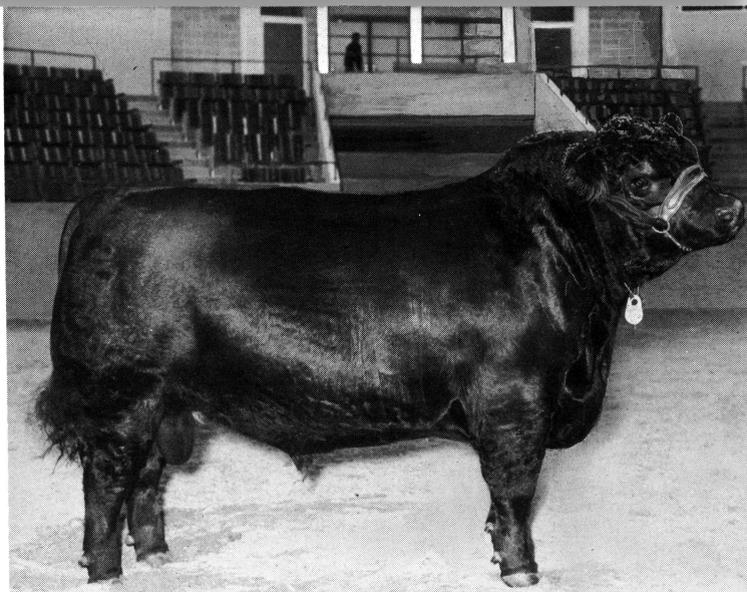
- a. *Establish a program for either September-November or January-March calving.*
- b. *Give all bulls a breeding soundness examination 30 to 60 days prior to the breeding season.*
- e. *Reduce the breeding season to 90 days by removing the bull from the herd. Sell unbred cows for slaughter.*
- f. *Do not use bulls under 18 months of age.*

If an 18 month old bull is used, limit him to not more than 20 cows.

- g. *Limit mature bulls to 30 cows in 90 days unless the cows are hand mated.*
- b. *When using more than one bull, rotate the bulls rather than allow all of them with the herd at the same time.*

Sort the cows in sire groups. Use electric fencing. Then you can obtain performance data on each sire's calves.

**Goal 6—Supervision of performance testing by reliable personnel from Extension, beef cattle breed associations, or Beef Cattle Improvement Assn.**



	Weight	Daily Gain	Conf. Score
Season herd average weaning weight	547	2.33	12.5
Preweaning 210 days	612	2.63	15
Feeding period 140 days	975	3.26	B+
Yearling 365 days	1134	2.92	B+

Loineye Est. Act. 1000 lbs. 13.0

*Performance records should be used in the selection of the herd bull and replacement heifers. This bull combines outstanding conformation and excellent record.*

Achievement of the goal of adequate supervision of performance testing will be a matter of getting the responsibility and expenses for testing assigned through a recognized program. Cooperation of the University's Extension personnel can be obtained for technical aspects.

**Goal 7—Instill in all purebred breeders a concern over performance standards as they produce bull and heifer replacements for commercial trade.**

The purebred breeders' main purpose is to produce replacement cattle for commercial trade. An educational effort, coordinated by the breed associations, the Beef Cattle Improvement Assn., and the Extension Service is needed to make this clearly understood.

**Goal 8—Have commercial producers aware of possible gains from cross breeding.**

Achievement of this goal also calls for an educational effort that can be coordinated through the breed associations, Beef Cattle Improvement Assn., and the Extension Service.

# Feeds and Forages



*Unimproved pastures produce small gains and, at current land prices, expensive gains.*

## *Need to double forage supplies*

### **Situation and Trends**

The Ozark area is the scene of rapid expansion in pastures, keeping pace with cow numbers which have doubled in the past 10 years. Improved pastures are being established at a rate of more than 2,000 acres per county per year. Also, much interest has been shown in aerial spraying and seeding of brush and low-quality timber. At least 150,000 acres have been treated this way in the past three years.

### **Goals**

The proposed doubling of the present 550,000 head of beef cows in the 44 Ozark counties by the early 1980s would also require a doubling of present forage supplies. This should be possible because of the acreage of brush that can be converted to grass economically, the estimates of unimproved open land, and possibilities of better grazing management. In addition to permitting increase in cow numbers, improved forage production can raise the net income from both present and additional cows.

Caution is urged in expansion of the cow numbers that they do not get ahead of the forage increase. Increase in cow numbers without increase in forage

supplies can be disastrous in times of drouth, a frequent occurrence in the Ozarks.

### **Problems and Solutions**

*Forage shortages in hot dry summers:* The committee recommends research on warm season grasses and legumes at the University's Southwest Center, Mt. Vernon, and at Bradford Farm. Tours to pastures that are furnishing good summer forage due to management, variety, stockpiling, or other reasons would also be helpful in spreading knowledge and discovery of improved methods of handling pastures.

The remaining suggestions are ones for individual producers to apply, although some meetings and tours might be organized to compare notes on how successful they are in putting these ideas into practice.

a. Use the amounts of lime, phosphorus, and potash that soil tests indicate will improve lespedezas, clovers, and alfalfa to supply pasture in years that are not extremely dry.

b. Alfalfa-orchardgrass meadow can be left for midsummer pasture after taking the first one or two cuttings for hay.



*Improved pastures are the basis of a sound nutrition program and greatly increase carrying capacity.*

c. Accumulated growth of fescue can be stockpiled by setting aside an area to be used in case of summer drouth. It will be less palatable and of lower feed value but may be more economical than high priced hay.

d. Possibly a better alternative than *c* is to have some reserve stored hay on hand for severe summer drouth. A good, low cost way to do this is to make round bales while the forage quality is still good and store them right in the field. Having reserve hay for summer may be as important as having hay for severe winter weather.

***Shallow, low fertility soils:*** Most soils of the Ozarks are very deficient in phosphorus and are low in other nutrients. Nearly all of the soils are shallow and many are rocky and steep.

More research is needed about the best kinds, rates, and timing of fertilizer applications for winter stockpiling of forage in the Ozarks.

Other obvious needs for research are plants adapted to our conditions, fertilizing requirements of these plants, and the relationship of grass tetany to magnesium content of forages.



*Many Ozark producers are converting unproductive timber land to forage through aerial spraying and seeding.*

More demonstrations, tours, and publicity would help get fertilizer used and used correctly by more people. Aerial application of seed, plant foods, and herbicides can help develop areas that are too steep for ground equipment. Greater use of soil testing to guide plant food applications is urged.

*Not enough attention to grazing management:* Many pastures are overgrazed. Little attention is given to producing winter pasture and winter feed supplies run short. Equipment to help sort, move, examine, weigh, and treat cattle is insufficient on most farms.

Management of pastures is largely up to individual producers although, again, tours and meetings can be organized to compare successful methods and spread knowledge of good techniques.

Recommended solutions for individual producers include:

(a) Plan well ahead for stockpiling summer and fall growth of fescue. ASCS "Feed Grain" programs have made this especially attractive. Many cow herds are being wintered on less than five bales of hay per cow by using 1 to 1½ acres of fertilized, stockpiled fescue pasture.

(b) Cross fencing and electric fencing can be used to rotate cows over pastures to reduce overgrazing. Development of more ponds, wells, and springs also helps give better grazing distribution.

(c) Aftermath following grass seed production is used for winter stockpiling by several successful producers.

(d) Late summer topdressing of fescue helps but does not give as big a response as spring applications because fescue makes about 70 percent of a year's potential growth from April 1 to July 1. Some risk is involved as weather can be too dry for fertilizer to be effective.

(e) As a temporary measure, cane, sudan hybrids, Gahi millet, and similar crops may be stockpiled. They tend to lodge and are more practical for early winter uses.

(f) Fall calving cows will need more supplemental feed on stockpiled fescue than cows that calve after January 1. Fall calves may require creep feeding for desirable growth.

(g) Simple, sturdy pens and chutes should be available for moving, sorting, loading, and treating cattle. Plans are available at University Extension Centers. Lumber yards could be of service in making the supplies and plans handier for use.

*Nutrition problems:* The need for information on the true need or lack of need for protein supplement when the cow herd is wintered on stockpiled fescue is illustrated by the great variation in feeding. Methods range all the way from feeding no protein to year around feeding of a salt and cottonseed meal mix.

Clearly, further research in supplementing winter pasture is needed to help guide Ozark herd owners. Some suggestions based on experience follow that might help individual producers until more definite recommendations can be established by research.

In many cases a small allowance of three to six pounds of alfalfa or other high quality hay is the most economical way to meet protein supplement needs. Excessive use of protein supplements has been known to cause calf scouring in addition to wasting money.

Vegetable proteins are preferred over urea when cattle are not getting grain. Cost per pound of actual protein should be considered.

Oklahoma tests have shown that protein supplements can be fed on alternate days, or even twice a week with good results and a saving of labor.

Protein supplements are more necessary for heifers and young growing cows.

Ozark soils and forages are low in phosphorus. Therefore greater attention should be paid to the calcium: phosphorus ratio. University Extension Centers can advise on this. Simple mixtures of iodized salt and dicalcium phosphate should be kept available free choice. (Keep this supplement dry.)

*Low gains and low palatability of fescue:* Research to develop more palatable fescues that boost gains offers hope for solving this problem. The work being done on this at the University's Experiment Station at Columbia and Southwest Center is much appreciated and the committee urges strong backing for this work.

Rotation grazing and clipping often increase fescue palatability. Growing legumes with fescue increases returns during periods when pure fescue makes low gains and low milk flow. However, it is difficult to maintain stands of legumes in fescue. More studies on this would be helpful.

An advantage of fall calving is that calves can be weaned and sold by the time of the worst drouths and the period when fescue is the poorest.



*Grasses can be cut early while their nutrition is high and stored as round bales in the pasture for use in summer drouth or wintering.*

The right use of fertilizers has proven helpful in maintaining legumes. Adequate supplies of lime, phosphates, and potash along with not over 30 pounds of nitrogen have favored legumes in fescue, both in experiments at the Southwest Center and on area farms.

Some form of tillage, and hard grazing on fescue before and just after seeding legumes in fescue sods appears to help establish a stand. Selective herbicides may also help.

**Short life of orchardgrass:** High soil temperatures kill orchardgrass. Research is in progress at the Southwest Center on this problem, attempting to develop disease resistant, long-life orchardgrasses. Most of the parent material came from fields 15 years old or older that survived several drouths.

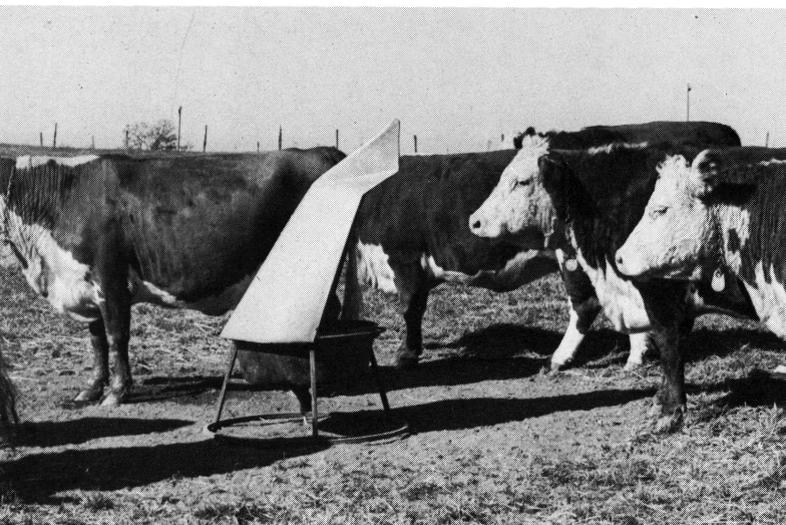
Avoiding overgrazing, practicing rotation grazing, and using orchardgrass where there is scattered shade all help prolong life of stands. Adequate soil fertility helps plants grow fast and provide soil shade. It also promotes general vigor.

**High cost and risk in establishing improved pastures:** Soil quality, terrain, presence or absence of brush and worthless trees, carrying capacity needs, available equipment, and financial positions vary greatly on Ozark farms. Therefore, the committee suggests several alternatives for establishment of improved pastures.

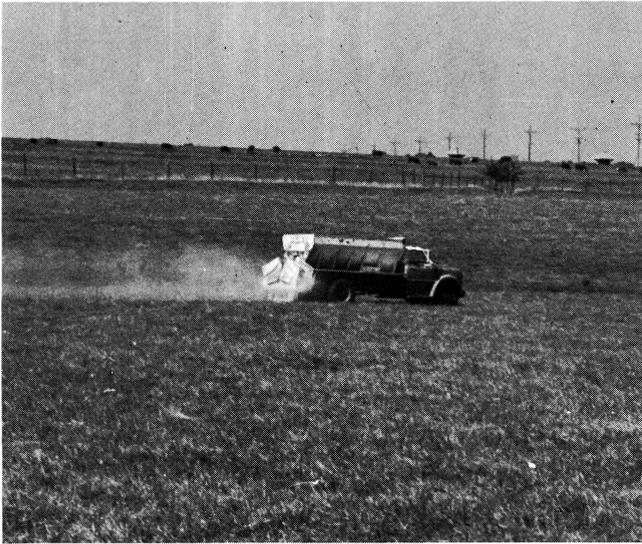
(1) Bring pasture up to the most desirable soil test level with excellent seedbed preparation and fertilizer. The cost would run from \$40 to \$60 per acre. Fertility levels should support alfalfa or trefoil or clover with fescue, orchardgrass, or brome. Such pastures get into high production quickly if you can afford the heavy financial investment.

(2) Begin with a moderate improvement, involving about 50 to 75 percent of the cost described in method 1 and using Summit lespedeza or clovers. In all but the very driest years, lespedeza is still excellent for mid-summer gains.

(3) Use a minimum cost, slow development method of developing a fescue based pasture, with



*Beef cattle should have access to minerals throughout the year.*



*Annual topdressing is essential for good pasture production.*



*Creep feeding should be considered when milk flow or pasture is short.*

or without lespedeza. Drill fescue seed with about 100 pounds of starter fertilizer into open land with little or no seedbed preparation, or broadcast after disking or harrowing. Sowing grass seed with small grains, sudan grass, and pearl millet would be a low cost method of getting the pasture started, too. Risks are high for this method of attempting to start a fescue sod but the costs are low, usually in the \$4 to \$8 range. If a satisfactory stand survives, plant food can be topdressed later.

On very rocky soil that is too rocky for equipment some producers report satisfactory stands by mixing fescue seed and fertilizer and spreading with a bulk spreader. The seed is covered by dragging a small tree behind a tractor.

(4) Aerial spraying and seeding of brush and low value timber is being done successfully at a total cost of about \$10 to \$12 per acre. Surveys show satisfactory stands have been established about 66 percent of the time by this method. Fifteen pounds of fescue seed per acre have given good results. Ten or 15 pounds of lespedeza will grow into a full stand. But if you want a full stand at once, 25 pounds is the recommended rate. See Guides at County University Extension Center for greater detail on seeding.

Much of this practice has been carried out on land totally unproductive in the past, with a market price of \$15 to \$25 per acre. Total cost of land, fence, spraying, and seeding often is \$50 or less.

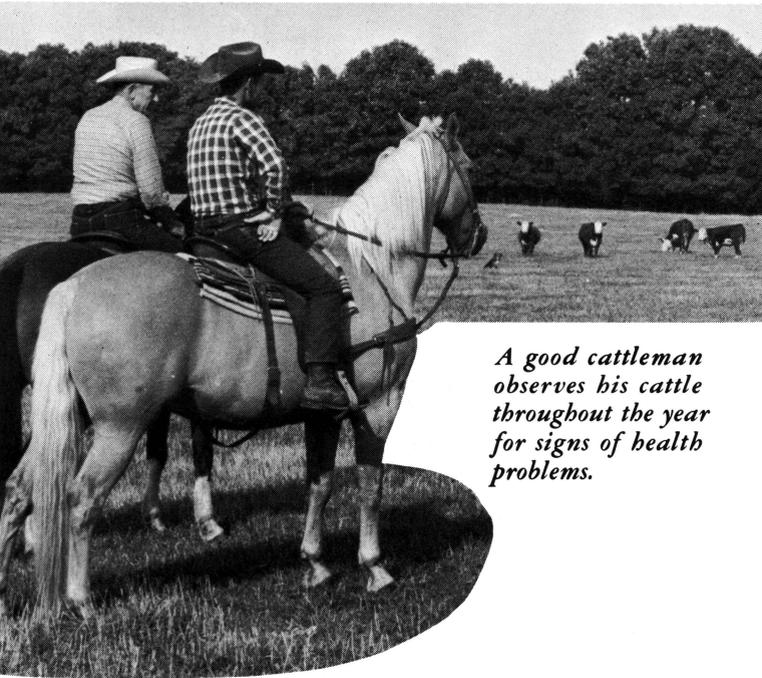
Farmers report six to eight acres support a cow, which means an investment cost of about \$300 to \$400 per cow unit.

**Grass Management:** After the stand is established, management includes these important points: (1) Allow grass to become well established before pasturing. (2) Do not graze close at any time; leave 3 to 4 inches of growth. (3) Graze on rotating basis if possible. (4) Give grass a rest period each year. *More research is needed on fertility treatments for bluegrass.*

**Weed and Brush Control:** This is a major problem in the Ozarks. It is another problem that is largely up to the individual pasture owner. Education on pasture weed identification and weed control demonstrations are needed, however.

Many pasture weeds and brush problems can be handled cheaper and better by herbicides than by mowing. More spraying equipment, possibly some of it used on a custom basis, would help in timely weed and insect control.

**Labor Shortage:** More well-managed systems of stockpiling winter feed will reduce labor requirements. Greater use of round bales as well as fescue pasture reserves are recommended for this. Further mechanization of hay handling helps and various stacking systems might be investigated.



*A good cattleman observes his cattle throughout the year for signs of health problems.*

# Herd Health

## **Situation and Trends**

Too many cow-calf operators do not have an organized disease and herd health program on their farm.

Cattle numbers are increasing, operations are getting larger and as this trend continues disease and health problems will increase. An organized program for maintaining a healthy herd will be more important in the future.

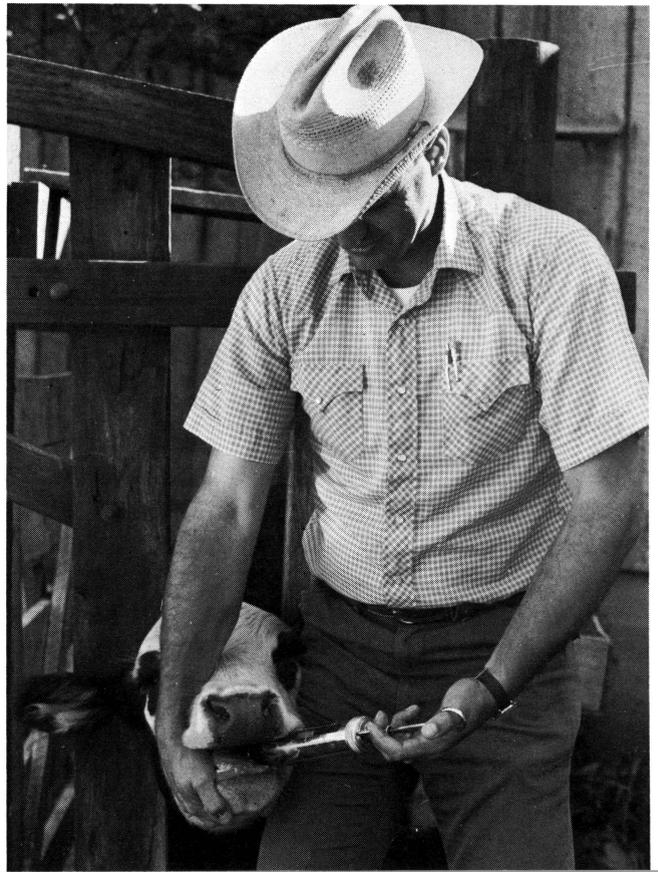
An animal must be free of diseases and parasites and be in a healthy condition to return a profit. Problems involving breeding, calving, milk production, diseases, and parasites which prevent the calf from making maximum growth must be controlled. Goals such as a 95 percent calf crop, weaning weights of more than 500 pounds, closely bunched calf crop, and a calf produced every 12 months can be attained with healthy herds.

## **Goals**

The Herd Health Committee set as its objective the development of a realistic disease control and herd health program that the majority of beef cattle operators can follow. Ideas of veterinarians, producers and other people connected with the beef cattle industry were pooled to produce the plan. Objective now is to get all phases of the beef industry work-

ing together to furnish the information and assistance the operators need to put it into effect.

*Cattle infested with internal parasites are slow gainers and respond profitably to treatment.*



## OZARK HERD HEALTH PROGRAM

A major problem for most cow-calf producers is obtaining disease-free breeding stock and keeping them healthy. To combat this problem the following program is recommended. It represents a pooling of the thinking of representatives of the Ozark cattle producer, veterinary, and other groups associated with our beef cattle industry.

### **Buy Your Breeding Stock from Reputable Breeders Who Have Production and Health Records.**

Whether you buy direct from the farm, at producer or association sales, or at an auction market, insist on buying cattle that have these records.

### **When Buying or Choosing Females—**

Check for age and test for pregnancy if animal is purchased as a bred animal. Examine for soundness, including udder and general physical condition. Require records of calthood vaccination for brucellosis or have the animals tested before buying them.

### **Your Herd's Vaccination and Testing Program**

There are still some areas in the state where brucellosis is a problem. If it is necessary to vaccinate, be sure you have calthood vaccination done at the recommended age of three to six months. Require a record of this in all animals you purchase or see that they are tested and proven clean before adding them to your herd. Test for tuberculosis and vaccinate young heifers for blackleg and malignant edema.

### **Health Requirements for the Bull**

Insist on production and health records when you buy a bull. Use a virgin bull or one that is tested for trichomoniasis and vibriosis. Have the veterinarian give the bull a fertility test and rectal examination (to check sex glands) within 30 days of purchase. Check for general soundness of feet and legs.

### **General Health Considerations:**

Isolate new animals at least 21 days.

Keep a good set of breeding and health records, including records of vaccination programs.

The annual program for cows should include vaccination for *leptospirosis* and *vibriosis* in special cases.

Be on the alert for other troubles which may develop, such as respiratory problems.

### **External Parasities:**

For *lice*, spray or dip in the fall and spring. Repeat in 18 days. Backrubbers can be constructed with chains or wire wrapped in burlap and strung between two posts for continuous use by cattle. The burlap is kept treated with insecticide and may give sufficient control without dipping the animals. Some pour-on treatments also are available.

For *flies*, *ticks*, and *mange*, continuous use of backrubbers will give fair control. Spray when needed.

For *grubs* give systemic applications in summer and fall as directed on the package. Avoid using phosphate types of materials if phenothiazene is being used for worms. The two when used together may cause toxic conditions.

### **Internal Parasites**

1. Stomach worms
  - a. Periodic fecal examinations
  - b. Control and treatment
    1. Pasture rotation
    2. Extra feed in stress times
    3. Worming agents
2. Tapeworms
  - a. Farmer observation of stool
  - b. Control and treatment
    1. Worming agent
    2. Rotate pastures
    3. Do not follow sheep or goats
3. Coccidiosis
  - a. Fecal examination (bloody)
  - b. Control and treatment
    1. Sanitation
    2. Pasture rotation
    3. Clean fresh water
    4. For specific drugs contact veterinarian

### **Annual Examination**

Check cows at least once a year for unsoundness of udders, feet, and eyes. At or near weaning time the cow should be checked to determine if she is pregnant. Bulls also should be checked for any unsoundness, and should have a semen check 30 days before the breeding season.

### **Seasonal Observation**

A good cattleman observes his cattle closely throughout the year for signs of health problems. In summer, close observation should be given for pink eye and external parasites. In cold season, things to look for especially include fescue foot, warts and ringworm, and internal parasite signs. Obtain professional help when needed.

### **Care of Cow at Calving**

Observe the cow three times a day when she is about to calve, in case assistance is needed.

Immediately after the cow has calved you may want to increase her feed so she will produce more milk and be in gaining condition to insure breeding on schedule.

Check the cow for mastitis and open teats.

Watch for signs of the cow failing to pass the placenta or afterbirth. Signs to watch for include: (1) The cord still protruding from the cow's vagina. (2) Cow appears sick and droopy. (3) Cow shows a discharge. When the placenta is retained in the cow it can cause an inflammation of the uterus and this leads to reduction in the milk supply. Loss of weight and death can also follow. For treatment, call for the veterinarian's professional help.

### **Calf Health Management**

Identify the newborn calf by one of the methods suggested in the management section.

Dip navel cord in iodine as soon after birth as you can to avoid navel ill and other infections.

Vaccinate for blackleg. Calves may be vaccinated at any age. If vaccinated at less than three months of age the immunity is of short duration and the calves should be revaccinated by six months of age.

Dehorn and castrate calves at least three weeks before they are weaned, preferably at 1 month of age.

Control lice and flies.

Vaccinate heifer calves for brucellosis when they are between three and six months old if you are in an area where this is a problem.

### **Calf Scours**

There are two types of calf scours. One results from the calf getting too much milk and the other from infection. A calf with milk scours may become dehydrated and weak which makes him more susceptible to the infectious scours and pneumonia.

Management control measures for milk scours include partial milking of the cow or reducing her food intake. The breeding background (especially if it includes some dairy breeding) may be something to consider in future mating and feeding of the cow or decision to sell her. A change in calving dates is a possibility if this becomes a big problem with your herd. The milk flow is heaviest on lush spring pastures.

Having the cows calve away from barns and lots will reduce risk of infectious scours.

A vaccination program is recommended as a preventive if your herd has a history of infectious scours. Vaccinate the cow with 5cc of mixed bacterin three weeks before she calves. Then vaccinate the calf with 5cc of mixed bacterin at birth.

If calves get infectious scours, they can be treated by a veterinarian with an injection of gamma globulin serum or whole blood from their mothers.

Supportive measures include the use of antibiotics, sulfa drugs and steroids.

### **Market Preconditioned Calves**

The Ozark Cow and Calf Committee recommends following a calf "preconditioning" program. Various surveys indicate shrink, sickness, and death losses experienced by feedlot operators on newly arrived cattle range from \$8 to \$20 per head.

A sound program for reducing this loss has been worked out by cooperative efforts of the Missouri Cattle Feeders, Missouri Cattlemen's Assn., Missouri Cooperative Feeders Livestock Assn., Farm Bureau, and Missouri Farmers Assn. The program involves "preconditioning" calves before they are shipped so they do not receive all their stress from treatments and shipping at once. It includes weaning and starting them on feed three weeks prior to expected sale date.

These groups developed the certificate pictured opposite. Copies can be obtained from the State Veterinarian's office at Jefferson City or County University of Missouri Extension Centers. Purpose is to provide this document, signed by the veterinarian, certifying that the calves sold have had the preconditioning steps performed on them on the dates indicated.

The future of this preconditioning program lies in the hands of the feeder. If he is not willing to pay more for cattle that are properly preconditioned, then few cattle will be preconditioned. Hopefully, cattle feeders will pay higher prices for calves that are accompanied by this certificate. It's an excellent program that can benefit the entire Missouri cattle industry.

# Missouri Certificate of Pre-conditioning

This certifies that the following pre-conditioning standards have been completed on the cattle herein described:

Identification:  
Breed:  
Age:

Number Steers -----  
Number Heifers -----  
Total -----

**Practices, Treatments & Immunization**

**Date**

**Product Used**

Weaned		
Castration (Knife only)		
Dehorning		
Grub Control (Optional)		
Internal Parasite Control		Thibenzole
Blackleg — Malignant Edema Vac.		
IBR - Vaccine		
Para Influenza — Vaccine		
Lepto - Vaccine		
Pasteurella Bacterin		
Other		

In addition to the above pre-conditioning practices, the heifers in this shipment are guaranteed open.  
(Optional)

General Remarks:

Certified By \_\_\_\_\_

*The beef cow in the Ozarks is not receiving the level of management she deserves. . .*



# Management

## Situation and Trends

The role of management in profitable beef production is of extreme importance. Any attempt to pinpoint just what management is, however, is an elusive goal. Management is many things—it is selection of systems and it is the proven power of a farm manager to implement these systems. It is the organization and timely application of resources.

The problem areas pointed out by other committees indicate that a majority of the Ozark herds are not making the best use of the resources available. The beef cow has not received the level of management which she can justify. Low weaning weights, dispersed calving, high costs of production, and too many calves grading less than choice are ample evidence to this charge.

Sufficient information based on research and practical application is available to correct these deficiencies. Then, why is the adoption of these practices lagging? Numerous explanations have been offered: lack of adequate financing; the attitude that "Anyone can raise beef cows," and the similar one that you can always raise beef cattle if nothing else can be raised on the farm. Many new producers haven't learned the essentials of beef husbandry.

Many have off-farm employment and beef raising is done "after hours."

No doubt there are more reasons and, perhaps, more valid reasons— but the fact remains that we are not doing as well as we can.

The beef cow numbers and the average size of the herds will continue to increase in this 44 county area in the 1970s. Farms will continue to grow larger and the operators, through sound management, will increase the per acre production of salable beef. Long range predictions indicate a need for 40 to 50 percent more beef cows based on population increases and per capita consumption.

More corn belt cattle feeders will be looking to this area for their replacement cattle. It is anticipated that more cattle will be fed in this immediate area. *The Ozarks does have a sleeping Giant—the potential of the beef cow is great—tomorrow it can be "the" cattle producing area of the United States.*

## Goals

The goal of management is to incorporate and execute the sound practices found elsewhere in the report in a management system that will yield the maximum net returns to the family consistent with their goals.



*Every farm needs livestock handling facilities. They can be elaborate (above, left) or inexpensive (above, right).*



*Bull runs with cows April 15 to June 15, then is removed.*



*Calves are born January 15 to March 15 and are ready to gain when spring pasture boosts milk flow*



*Product is a 500 pound calf by September.*

## Problems and Solutions

### Income per cow is too low in many herds.

The major factors causing low income per cow are low *average weight of calves* sold, low *percentage of calves* sold in relation to number of cows exposed to bull (if 24 calves are raised from 30 cows exposed to bulls, this means an 80 percent calf crop), and a *low average value per pound* of calf sold.

Methods discussed in the Herd Health section should increase calving percentage. Breeding programs which influence weaning weights and value per pound of calf (due to quality) also are discussed in another section.

Calf weights and uniformity are also influenced by the system of production. Careful attention should be given to selecting the calving system. This committee feels that the most profitable production systems are: fall calves (Sept. 15-Nov. 15) and winter calves (Jan. 15-March 15). Except in very specialized operations, late spring and summer calves should be avoided. These calves are too light in the fall and are born at the time of the year when internal and external parasites are most active. The calf is not large enough to make full use of the milk flow, resulting from good grass, nor can it utilize much grass.



*Getting herds into and maintaining a 60 to 90 day calving period starts with keeping the bull separate except during the breeding season.*

Fall calves are dropped during the most ideal weather of the year, although flies may still be a problem. They offer more flexibility of selling in that they have sufficient weight (assuming good feeding and management) to be sold by midsummer at prices generally higher than fall prices. If pasture conditions are favorable the calves may be grazed until fall and should weigh over 550 pounds. This system probably fits a straight fescue program best. The profit key to this program is the cost of furnishing ample quantities of palatable feed to secure desirable gains, especially during the winter months. Creep feeding of the calves may be required.

Cows that are to calve October 15 must be bred about January 15. Nutrition must be adequate to insure rebreeding.

Winter calves (January 15-March 15) are more popular in the Ozark area than fall calves. There are disadvantages with the weather at time of calving being the greatest. As with fall calves, rebreeding the cows, particularly for January calves, may present some problems if the nutritional level is too low. There are advantages, however. More of the cow's peak demand (the first five months of lactation) will come in peak grass time. By grass time the calf is large enough to consume considerable quantities of grass, resulting in faster gain. The chance of the calf's showing more bloom in the fall is greater. Calving in the cold months requires more attention, particularly first-calf heifers. Winter calves tend to have a longer initial parasite-free period.

The major consideration of choosing fall or winter calving is the availability of labor at critical times such as calving time, castration, etc. A planned forage program is essential to the success of any cattle system, but it is a "must" for fall calving to insure adequate, economical nutrition that will re-

sult in satisfactory winter gains. Larger operations may find economies in bull use, labor distribution, etc., in using both fall and winter calving.

In all cases a relatively short calving season permits better management. Cows can be fed more easily according to the job they are doing. Calves can be marketed in more uniform lots.

**Costs of production per cow are excessive on many farms.**

Part of this may be due to low production per cow. But there is also the danger of production costs being too high even with acceptable cow production.

The cost of wintering must be held to a minimum consistent with desired production. Winter pasture of fescue offers real possibilities. Round bales of fescue left in the field offer one low cost way of providing winter feed. Silage is excellent cow feed but on most farms is too expensive.

Hay testing can give accurate guides to supplementation needs. The cost of properly yet not excessively supplementing roughage must be calculated. Buy only the supplementation needed and through the cheapest source. Convenience of feeding should also receive consideration.

Over-feeding of cows can greatly increase costs and actually lower the cows' productivity. A cattleman must train himself to determine cow feed needs on the basis of body condition.

**Many herds are so small that it is difficult to justify their existence financially.**

It is the committee's judgement that herds should contain at least 20 cows. On many farms a sound forage program could increase carrying capacity to this level, where the resources could be used more effectively and production costs lowered.

Small herds (20 cows or less) present problems in justifying expenditures for desirable bulls and equipment, due to the high costs that must be allocated per cow.

If an operator cannot keep as many as 20 cows, perhaps a steer operation would be more feasible.

**A relatively short calving period of 60 to 90 days should be a management goal.**

Achieving this goal will be a key step toward more effective management and ease of management. The smaller herds, of 60 cows or less, should consider one calving period, whereas, the larger herds might be more efficient with two or more calving periods.

The major advantages of bunched calving periods are: they permit more correct feeding of herd, especially during winter; less time is spent in observation at calving and feeding; less time is needed in doing such jobs as castration and vaccination; the calf crop is more uniform which has advantages in selling and selection of replacements. Year around calving invites poor management.

Getting herds into and maintaining a 60-90 day calving period starts with keeping the bull separate from herd except during breeding season. Further pointers on this management practice may be found in breeding section. Every precaution must be taken to insure fertility of both the bull and females. Observation and simple breeding records can spot cows which return to heat, which is a danger signal that breeding problems exist.

Pregnancy checking and culling of hard breeders help calving period and percent of calf crop. Cows that are too far out of cycle should be sold. Particular attention must be given to breeding replacement heifers to insure they will fit calving period. First calf heifers must receive adequate nutrition during lactation to insure both milk production and rebreeding and staying in schedule.

**Selection of replacements presents management problems in small herds and, to some degree, in cross-breeding operations.**

Purchase of replacements is one solution.

*Advantages of buying replacements would be:*

1. Eliminates having different groups of cattle to work with.
2. Allows longer use of superior bulls.
3. Permits buying groups of similarly bred heifers.

4. Allows more flexibility in a cross-breeding program.
5. Quicker returns as compared to raising replacements.

*There are some disadvantages:*

1. Danger of introducing disease into the herd.
2. Possibly females that are genetically superior to the managers cannot be purchased at a price he feels he can afford.
3. Difficulty of finding suitable replacements at feasible prices.

Selection of replacements offers more management problems in the one-bull herd. In spite of the problems of health and selection this committee feels that many producers might consider purchasing replacements, particularly, if a cross-breeding program is to be followed and maximum heterosis and uniformity realized.

The purchase of cows represents a greater investment but quicker returns than raising of replacements. If the farm situation requires income relatively soon, cow-calf pairs would be first choice, bred cows second, bred heifers third, and open heifers fourth. If a herd is being built for future income the order might be reversed.

**Not all animals are marked for identification.**

The economics committee report states the importance of records as a basis for wise management decisions. Individual animal identification is essential to good records. The most popular methods are tattooing, branding (hot and freeze), ear tagging, ear notching, and using neck chains and dewlap tags.

The tattoo in the ear is the most positive means, but requires restraining the animal to read the tattoo. Branding is permanent and some cattlemen feel it deters theft. Numerals must be used for individual animal identification. Ear tags vary in their readability, depending on size, legibility of the number, and how well the tags stay in the ear.

One of the systems above is essential for easy individual identification if a useful set of records is to be kept. This committee strongly feels that records are essential to a sound beef cow-calf program.

The opportunities for low cost production *and marketing* of feeder cattle in the Ozark Area are unsurpassed anywhere in the country. The area is next door to feeding areas in North Missouri, the Delta, Oklahoma, Texas, Kansas, Iowa, and Illinois, which reduces the transfer cost of feeder cattle. Land costs are relatively low.



—One of the most modern auction marketing facilities in the state is located near West Plains.

# Marketing

## Situation and Trends

Currently, there are 38 livestock auction markets in the 44-county area that are registered with Packer and Stockyards Administration. There are two central markets, one at Springfield and one at Joplin.

In this same area there are 17 Missouri cooperative feeder calf sales that held a total of 40 sale days in 1968. Some of the area also has access to markets in Mexico, Mo., and the central markets in St. Louis and Kansas City. Other types of marketing are carried on through dealers, direct to feeders, and through marketing groups and organizations.

All these markets play an important part in the total marketing system in the Ozark Area.

It is the opinion of the Committee that this area is fairly well supplied with competitive markets for feeder livestock.

The average weight of calves in the Ozark Area when sold or weaned is around 400 pounds. This is rather low.

Table 1 shows the average extra income calves of three different weights would have brought in Virginia feeder cattle sales between 1958 and 1967 if they had weighed 50 pounds more. Such figures can be used as a guide in deciding whether costs of the extra pounds would offset the income from them.

For example, Choice grade steers weighing 425 pounds averaged \$14.80 per head more than the 375 pound steers. This amounts to \$29.60 per hundred-weight or about 29½ cents a pound for each additional pound. Note that the value of additional pounds declines, however, as the weight goes up.

Summaries of the prices received at selected Missouri cooperative feeder cattle sales (Table 2) for the years 1965-67 show smaller returns for additional

Table 1

### VALUE OF ADDED WIEGHT ON FEEDER CALVES IN VIRGINIA FEEDER CALF SALES; 1958-67\*

Weights Compared	Average Value of 50 Extra Pounds			
	Steers		Heifers	
	Choice	Good	Choice	Good
375 and 425	\$14.80	\$13.60	\$14.20	\$12.95
425 and 475	11.80	11.05	11.80	10.63
475 and 525	9.80	9.15	10.40	14.00

\*Data source: Virginia cooperative feeder cattle sales, 1958-67

Table 2

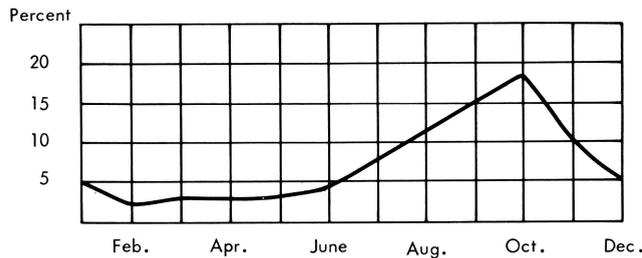
**VALUE OF ADDED WEIGHT ON STEER FEEDER CALVES  
IN MISSOURI FEEDER CALF SALES; 1965-67**

Average Value of 50 Extra Pounds	
Weights Compared	(all grades)
400 and 450	\$9.50
450 and 500	9.00

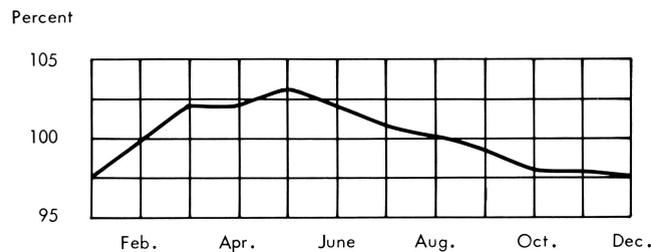
weight than the Virginia figures. But the amounts received still more than paid for the cost of producing the heavier calves.

The lower values from the Missouri sales had at least three causes: (1) Missouri figures were for all grades of steer calves. (2) Average prices were lower for the years 1965-67. (3) There are indications that the price differential between light and heavy calves is becoming wider.

The largest number of feeder cattle go to market in September, October, and November in this region as well as most others in the country (see Fig. 1). Unfortunately, these are the months when prices are lowest (Fig. 2).



**Fig. 1—Shipment of feeder cattle and calves from Springfield Union Stock Yards. Monthly average as percent of annual average 1963-67.**



**Fig. 2—Monthly average price of choice steer calves weighing 300 to 550 pounds; Kansas City, 1963-67. Monthly prices are shown as percent of annual averages.**

Cause of this dilemma is the seasonal production of grass. The spring peak in prices is due to demand for calves to go on pastures. The late summer and fall low is a result of larger marketing as calves are weaned and the pasture season ends.

**Problems and Solutions**

The problems that this marketing study committee feels are realistic to this area and some possible solutions follow:

*1. Many feeder calf producers do not know the quality or value of animals they have for sale.*

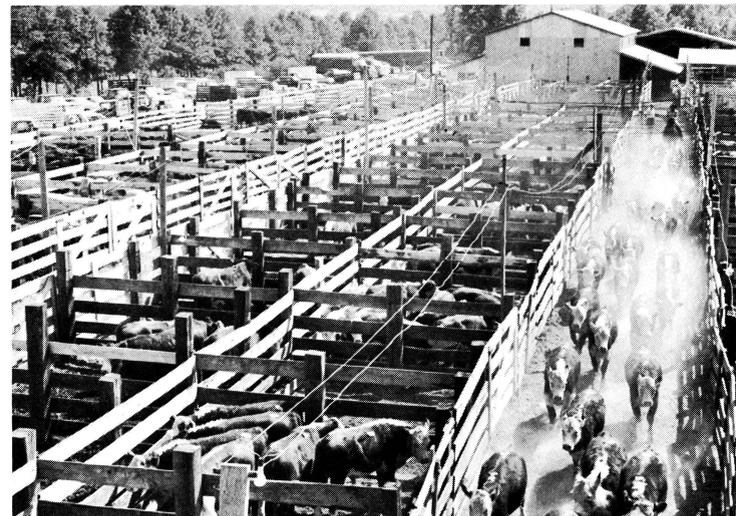
Educational activities on the grade and value of cattle should be held on a county or area basis annually to provide farmers the opportunity to sharpen their skills in grading cattle.

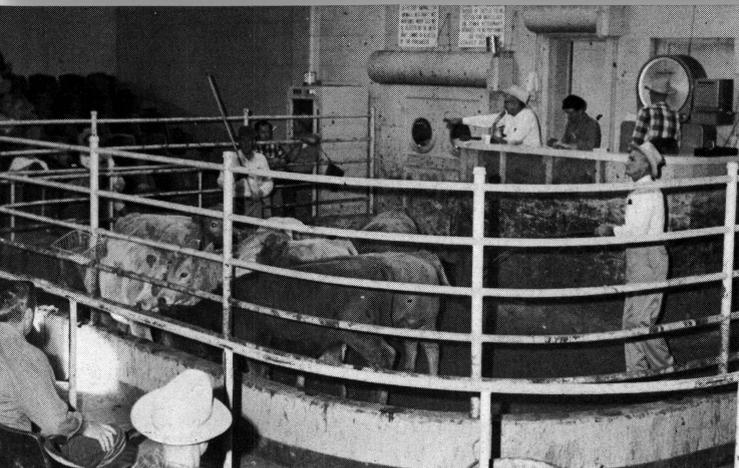
The feeder calf producer who does not have the time or opportunity to keep abreast of current values should market his calves by a method that will develop price for him, such as an auction or a terminal market with good buyer representation.

*2. A large percentage of the feeder calves produced are too low in quality to receive top prices.*

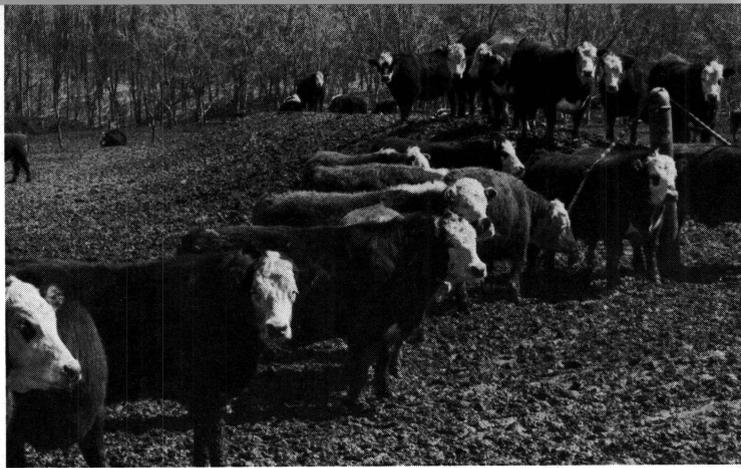
Choice steer calf prices averaged \$3.45 per cwt. more than good grade calves of the same weight for the years 1963-67 at one of the Missouri markets.

*Seventeen Missouri cooperative feeder calf sales facilities held a total of 40 sale days in the Ozark Area last year. (Salem News photo).*





*Two terminal markets service the area.*



*Ultimate goal—calves that perform well in feedlot.*

This amounts to an average of \$15 or more per head which is more than the additional cost of producing the better quality calves. Calf quality can only be improved through selection of good breeding stock. The details of proper selection are discussed in another section.

**3. *The average weight of calves produced in this region when sold or weaned is too low (less than 400 pounds).***

As illustrated in Tables 1 and 2, producing and marketing heavier calves would increase income from the cow herds. The heavy calves may not have the profit advantage in the future that they have had in the past. But feeder calf producers should keep abreast of the relative prices of the different weights of calves and adjust production plans accordingly.

Recommendations on how to produce heavy calves are in other sections of this publication.

**4. *Shrinkage, crippling, and even death while cattle are being handled and transported cause big losses.***

The amount of shrinkage incurred in the marketing process is closely associated with the time animals are off feed and water. Thus, if a method of marketing is used that takes more than one day, the cattle should be fed and watered.

Some work has been done to test the influence of tranquilizers on shrinkage of feeder cattle. Results have been only fair. Present information indicates that tranquilizers probably will reduce shrink of feeder cattle during transport over long distances but maybe not enough to offset the cost.

Most crippling and death loss is due to poor facilities, and to human attributes: hurry, carelessness, impatience. These losses can be reduced by proper loading and handling facilities, by careful handling, by loading vehicles properly, by using the right type and quantity of bedding, by having adequate ventilation, by use of partitions in large vehicles and keeping the interior of rack in good condition. Inspect for protruding nails and splinters.

**5. *Many feeder calf producers have a small number of calves to market at a given time.***

Usually, such groups of calves lack uniformity in weight, grade, sex, and age. If they are sorted properly they will be in small lots which may reduce the price.

Some markets pool consignments and develop larger lots of uniform cattle. In most instances the small producer will gain by using a market of this type.

**6. *Some areas lack adequate daily and weekly market news.***

Some radio and newspaper reports give price only. The Marketing Committee feels these reports could be improved by adding trends for the day compared to previous market day or previous market week.

**7. *Feeder calf prices tend to be lowest when most of the calves are marketed in the fall.***

This problem was illustrated in Figures 1 and 2 and discussed in the situation statement.

No solution seems available to remedy this problem with present methods of producing feed.

