

Second Edition

Cow-Calf Management Guide

& Cattle Producer's Library

- Installing the *Cow-Calf Management Guide & Cattle Producer's Library*
- CD-ROM User Guide
- Western Beef Resource Committee and information about the *Cow-Calf Management Guide & Cattle Producer's Library*
- Index for the *Cow-Calf Management Guide & Cattle Producer's Library*
- 2002 Digital Edition (CD-ROM version 2) for the *Cow-Calf Management Guide & Cattle Producer's Library*

INTRODUCTION

- CL100 [Introduction—Cow-Calf Management Guide & Cattle Producer's Library](#)
- CL102 Planning Ahead
- CL104 Integrated Resource Management: A Concept to Provide Profitable Resource Management for Cattle Producers
- CL106 Herd Data: The Clues to Cow Efficiency
- CL107 Management by Objectives
- CL108 "Whole-Ranch" Planning and Management

MANAGEMENT GUIDE

- CL109 [How to Use the Total Beef Program Management Guide & Cattle Producer's Library](#)

Producer Management Guides

- CL110 I. Last Trimester of Pregnancy (3 Months Before Calving)
- CL115 II. Calving Season—Cows
- CL117 II. Calving Season—Calves
- CL118 IIa. Branding and Processing Calves
- CL120 III. Breeding Season
- CL125 IV. Grazing Season—Range
- CL127 IV. Grazing Season—Irrigated Pasture
- CL130 V. Weaning—Cows
- CL132 V. Weaning—Calves
- CL135 VI. Wintering—Cows and Bulls
- CL140 [VII. Replacement Heifers](#)
- CL145 VIII. Ranch Management and Financing
- CL150 IX. Developing a Marketing Plan

January 2002

TROUBLESHOOTING GUIDE

[CL175](#) [Total Beef Program Troubleshooting Guide](#)

QUALITY ASSURANCE

- CL200 The Cattle Producer's Role in Beef Quality Assurance
- CL210 Reduction of Handling Stress Improves Productivity and Welfare
- CL212 Beef Quality Assurance: Eliminating Drug Residues
- [CL213](#) [Food Safety and Quality Assurance: From the Farm to the Table](#)
- CL215 Beef Quality Assurance for Marketed Cows and Bulls
- CL218 Beef Cow Rights and Cow-Calf Well-Being
- CL280 Beef Measles and Beef Quality
- CL285 Individual Animal Identification: Quality Assurance, Verification, and Value-added Marketing
- CL290 Beef Quality Assurance Resources

NUTRITION

- CL300 Nutrient Requirements of Beef Cattle
- CL301 Typical Composition of Common Beef Cattle Feeds
- CL303 Evaluating Your Cattle Herd's Need for Supplemental Nutrients
- CL304 Forage Terminology
- CL305 Common Sense Feed Analysis and Interpreting Forage Analysis
- [CL306](#) [Reading a Feed Label](#)
- CL307 Interpreting Water Analysis
- CL308 Economic Implications of Nutrition and Management
- CL309 Buying and Selling Feeds Using Corrections for Moisture and Concentration of Nutrients
- CL310 Ration Balancing
- CL311 NRC as a Tool in Beef Nutrition Analysis
- CL312 Limiting Feed Intake
- CL313 Pricing Protein and Energy Supplements
- CL314 Alternative Winter Nutritional Management Strategies
- CL315 Micronutrients and the Immune System of Cattle
- CL316 Beef Cattle Nutrition: Feeding for Two
- CL317 Fundamentals of Supplementing Low-Quality Forage
- CL318 Supplementation Strategies for Beef Cattle Consuming Low-Quality Forage
- CL319 Alfalfa for Beef Cows
- CL320 The Fermentation Process and Silage Troubleshooting
- CL321 Silage Additives

NUTRITION (cont'd)

- CL323 Haylage
- CL324 Corn Silage
- CL330 Nutrition of the Mature Beef Cow
- CL331 Effect of Prenatal Nutrition on Subsequent Cow and Calf Performance
- CL332 Barley for Beef Cattle
- CL333 Influence of Grain Type and Processing Method on Beef Cattle Consuming Forage-based Diets
- CL340 Preparing Calves for the Feedlot
- CL355 Nitrates in Cattle Feed and Water
- CL365 Wheat: Its Nutritive Value for Beef Cattle
- CL370 Value and Quality Assurance of Byproduct Feeds
- CL380 Computers for Cattle Nutrition
- CL381 Vitamin Nutrition of Cattle Consuming Forages: Is There a Need for Supplementation?
- CL382 Ammoniation and Use of Ammoniated Low Quality Roughages

REPRODUCTION

- CL400 [The Biological Cycle of the Beef Cow](#)
- Biological-Chronological Beef Cow Wheel
- CL402 Overview of Fetal Development
- CL404 Artificial Insemination of Beef Cattle
- CL405 Synchronizing Estrus in Beef Cattle
- CL406 Tips to Improve A.I. Pregnancy Rates
- CL408 Embryo Transfer
- CL410 Shortening the Calving Season
- CL412 Pregnancy Testing
- CL413 Rebreeding the First-Calf Heifer
- CL421 Purchasing and Managing Young Bulls
- CL424 Reproductive Tract Anatomy and Physiology of the Bull
- CL425 Identifying the Functional Bull:
Bull Soundness and Management
- CL435 Bull Management Before the Breeding Season
- CL436 Bull Management and Care in the Western U.S.
During and After the Breeding Season
- CL440 Reproductive Tract Anatomy and Physiology of the Cow
- CL442 Use of Reproductive Tract Scoring in Range Beef Heifers
- CL446 Pelvic Area in Beef Cattle Production
- CL447 Handling Calving Difficulties
- CL450 Designing a Cattle Obstetric Stall

RANGE AND PASTURE

- CL500 Developing Management Strategies for Rangeland Grazing
- CL502 [Designing Your Grazing System](#)
- CL505 Range Plants—Foundation of the Grazing Resource
- CL510 Range Plant Growth and Development
- CL515 Range Ecology and Condition: Their Relationship to Management
- CL520 Photo Monitoring Your Range
- CL522 Options for Riparian Grazing Management
- CL523 Riparian Pastures
- CL535 Use of Water and Other Tools for Improved Grazing Management
- CL536 An Introduction to High-tensile, Smooth-wire Electric Fencing
- CL540 Range Improvements: Ways to Increase Forage Production
- CL541 Solar Stockwater Systems
- CL542 Noxious Weeds on Rangelands
- CL545 Range Nutrition in Relation to Management
- CL550 Poisonous Plants: Management and Control Recommendations
- CL580 Alfalfa Hay Management
- CL581 Management to Minimize Hay Waste
- CL590 Irrigated Pastures
- CL592 Intensively Managed Rotational Grazing Systems for Irrigated Cool Season Pastures
- CL594 Pasture Fertilization
- CL596 Pasture Management and Problems While Grazing
- CL599 Range Management Terms, Definitions, and Acronyms

ANIMAL HEALTH

- CL600 Immunology: Maximizing the Immune Response of the Cow to Increase Profits and Production
- CL601 Identifying and Minimizing Stress in Cow-Calf Operations
- CL602 Biosecurity: Protecting Your Cow-Calf Operation
- CL603 Evaluating Dead Cattle: A Necropsy Guide for the Cow-Calf Operation
- CL604 Cow Mortality Disposal
- CL605 General Principles of Vaccination and Vaccines
- CL606 Antibiotic Metaphylaxis to Control Respiratory Disease
- CL607 Bovine Respiratory Disease
- CL608 Bovine Spongiform Encephalopathy (Mad Cow Disease): What Is Our Risk in America?

ANIMAL HEALTH (cont'd)

- CL609 Analysis of Water Quality for Livestock
- CL610 Vital Signs in Animals: What Cattle Producers Should Know About Them
- CL612 Prussic Acid Poisoning
- CL615 Chemical Disinfection: A Guide for the Cow-Calf Operation
- CL619 Toxic Contaminants in Harvested Forages
- CL620 Lumpy Jaw and Wooden Tongue in Cattle
- CL621 Urinary Calculi in Beef Cattle
- CL624 Acidosis
- CL625 Bloat Prevention and Treatment
- CL627 Grass Tetany in Beef Cattle
- CL628 White Muscle Disease and Other Selenium-Responsive Diseases of Livestock
- CL629 Copper: An Essential Micronutrient for Beef Cattle
- CL630 Acute Bovine Pulmonary Edema and Emphysema in Beef Cattle: Causes and Prevention
- CL631 Pulmonary Artery Pressure as a Tool for Managing Brisket Disease
- CL632 Mycotoxins
- CL635 [Halogeton Poisoning](#)
- CL636 Pine Needle Abortion in Cattle
- CL639 Foot Rot of Cattle
- CL640 "Cancer Eye"—Its Treatment and Prevention
- CL644 Feeding Colostrum to a Calf
- CL645 Prevention of Calf Scours
- CL646 Calf Scours: Causes and Treatment
- CL648 Prevention of Baby Calf Diseases
- CL649 Treatment of Sick Calves
- CL650 Bovine Virus Diarrhea (BVD) Infections
- CL652 Sudden Death in Feeder Cattle
- CL653 Hemophilus Encephalitis (TEME) in Feeder Cattle
- CL654 Clostridial Diseases
- CL655 Bacillary Hemoglobinuria (Redwater Disease) in Cattle
- CL657 Bovine Anaplasmosis
- CL659 Trichomoniasis
- CL660 Injuries and Diseases of Beef Cattle Associated with Calving
- CL661 Diseases of Beef Cattle Associated with Post-calving and Breeding
- CL662 Leptospirosis: A Disease That Never Left the Field

ANIMAL HEALTH (cont'd)

- CL663 Brucellosis Considerations for Western Beef Herds
- CL666 Foreign Animal Disease—A Never Ending Threat:
Foot-and-Mouth Disease (FMD) *[video]*
- CL667 Bluetongue in Cattle
- CL671 Some Questions and Answers About Johne's Disease
in Cattle
- CL672 Critical Management Points for Prevention and Control
of Johne's Disease in Cattle
- CL675 Infectious Bovine Rhinotracheitis
- CL678 Pinkeye
- CL681 Abortion of Cattle
- CL683 Vibriosis (*Campylobacteriosis*)
- CL684 Foothill Abortion: A Western States Problem?
- CL685 Coccidiosis in Beef Cattle
- CL688 Liver Fluke Prevention for Cattle
- CL690 Internal Parasites in Cattle
- CL691 External Parasites: Economic Impact, Control, and Prevention

MANAGEMENT

- CL710 Cattle Identification
- CL712 Methods of Determining Age of Cattle
- CL720 Condition Scoring of Beef Cattle
- CL733 Beef Cow Efficiency in Western Rangelands
- CL734 Beef Cow Mammary System
- CL735 [Culling the Beef Cattle Herd](#)
- CL737 Feeding and Marketing Cull Cows
- CL745 How to Select, Grow, and Manage Replacement Heifers
- CL747 Time of Weaning and Cow Condition
- CL748 Weaning Management for Calves
- CL750 Dehorning—Castration—Branding
- CL752 Spaying Heifers
- CL755 Beef Cattle Implants
- CL760 Winter Stress in Beef Cattle
- CL775 Frame Scores and Feeder Cattle Grades
- CL785 Management of Neonatal Beef Calves
- CL786 Artificial Rearing of Calves on Milk Replacer Diets
- CL787 Grafting Calves
- CL788 Care of Hypothermic (Cold Stressed)
Newborn Beef Calves
- CL790 Protective Shelters for Beef Calves

MANAGEMENT (cont'd)

- CL791 Low-Stress Livestock Handling on Pasture and Range
- CL792 Cattle Psychology During Handling and Corral Design
- CL793 Livestock Scales Selection for Cattle Ranches

MARKETING

- CL800 Considerations for Calf Marketing Pools
- CL805 The Right Price, the Right Market for Your Cattle
- CL810 Market Reports
- [CL815 Video Auctions Are Viable Marketing Alternatives for Cattle](#)
- CL816 Selling Cattle on the Slide
- CL820 Alternatives for Calves and Feeders
- CL822 The Cattle Cycle: Seven Indicators
- CL823 Seasonal Patterns of Cattle Prices
- CL825 Beef Carcass Grading and Pricing
- CL830 Retained Ownership and Custom Feeding
- CL832 Custom Feedlot Selection Checklist
- CL835 Shrinkage in Beef Cattle
- CL840 Futures Market: Basics
- CL843 Commodity Options as Price Insurance for Cattle Producers
- CL845 Evaluating Forward Prices with Basis
- CL850 Packer Concentration and Captive Supplies
- CL855 International Beef and Cattle Trade

FINANCE

- CL900 Real Records for REAL Ranchers
- CL905 Farm and Ranch Financial Dictionary
- CL915 Farm Financial Standards
- CL917 Financial Ratio Analysis: What Do the Numbers Mean?
- CL918 Common Errors in Financial Record Keeping
- CL925 Partial Budgeting
- CL930 Enterprise Budgets for Cow-Calf Operators
- CL932 The Costs of Raising Replacement Heifers and the Value of a Purchased vs. Raised Replacement
- CL935 Cash-Flow Budgeting
- [CL940 Sources of Credit](#)
- CL942 Working with Your Lender in Times of Financial Stress
- CL950 Financial Statements: The Balance Sheets

FINANCE (cont'd)

- CL951 Income Statement Preparation and Use
- CL955 What Is a Cow Worth?
- CL960 Beef Cow Share Lease Arrangements
- CL965 Should I Sell My Cow Herd?

GENETICS

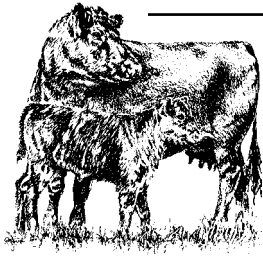
- CL1002 The Systems Concept of Beef Production
- CL1015 Beef Cattle Improvement Calving Period and Days of Age Chart
- CL1020 Applying Principles of Crossbreeding
- CL1021 Composite Cattle for Commercial Cow-Calf Producers
- CL1024 Genetics of Reproduction
- CL1026 Congenital Defects in Cattle
- CL1035 Collecting Performance Records for Herd Improvement
- CL1037 Understanding and Using Sire Summaries
- CL1038 Commercial Beef Sire Selection
- [CL1041 Selecting for Carcass Traits](#)
- CL1045 Breed Association Address List

DROUGHT AND OTHER NATURAL DISASTERS

- CL1100 Cattle Management During Drought
- CL1110 Tips for Dealing with Drought on Range
- CL1120 Emergency Rations for Wintering Beef Cows
- CL1130 Drought Management Strategies for Beef Cattle
- CL1135 Drought Advisory: Managing Irrigated Pastures and Grass Haylands
- CL1140 Substituting Grain for Hay
- CL1170 Supplementation During Drought
- [CL1180 Weather Related Sale of Livestock and the Tax Implications](#)

MISCELLANEOUS

- CL1200 Beef Performance Glossary
- [CL1255 Recreational Enterprises Can Complement Beef Production](#)
- CL1270 Understanding the Basics of Managing Ranch Labor
- CL1280 Conversions for Commonly Used Weights and Measures



Western Beef Resource Committee

Cow-Calf Management Guide

Introduction Section

CL100

INTRODUCTION

Cow-Calf Management Guide & Cattle Producer's Library

*J D Mankin, Former Extension Animal Scientist
University of Idaho*

The Total Beef Program is a collection of fact sheets that are resources for any size cow-calf operation. Material in the cow-calf section has been developed by a regional committee made up of Cooperative Extension System animal scientists and industry representatives from Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming.

The committee set the following objectives:

1. To develop or collect as complete a set of informative material as can be found that has a bearing on the cow-calf operation. This material has been put into a **Cattle Producer's Library**. The information in the Library is in brief, easy-to-read fact sheets that deal with specific subjects. They are written by specialists that the committee considered the best authorities in a particular subject area.
2. To make the Cattle Producer's Library meaningful by developing a **Management Guide** that would tie this information to the biological cycles of the cow and to the ranching activities that go on throughout the year. The Management Guide is designed to give meaning to these activities by defining by objective the reason for each action. The Guide also points out some important things to remember while engaged in these activities. That Guide has a **planning-ahead section** to help make the next activity in that biological cycle easier or more productive.
3. To develop support material for the Management Guide in the form of videocassettes or slide-tape sets.

This Management Guide is written to remind the beef producer of the critical times where attention to details of management will pay big dividends. The material presented and the guides hopefully will suggest some things that you can do or adapt to your operation that will be profitable to you.

Regardless of where you are or how you operate, you must manage within the confines of the biological facts or beef production. The following are facts that all cattle producers know and take for granted. Producers sometimes expect Mother Nature to bend her rules to fit their management plan. Facts that cannot be changed are:

1. An egg and a sperm must come together in the proper circumstances to make a new calf.
2. The length of pregnancy in beef cattle is approximately 282 days.
3. The normal cow takes approximately 40 days after calving to return to estrous and be prepared to start a new pregnancy.
4. The estrus cycle is approximately 21 days.
5. Puberty is a function of age and size.
6. Certain nutrients are required for growth and production.
7. Wide variation occurs in growth rate and in limits to that growth rate.
8. In most cases, the biological cycle of the cow must be managed within the climate and seasonal limitations of one locality.

9. Disease problems are a constant threat.

10. Cows and bulls pass on to their offspring both desirable and undesirable traits.

Every operator, facing the formidable task of managing a beef herd to a profitable level, must take these biological facts into consideration. This must be done within the abilities, limits, and philosophy of the operator and the specific skill, knowledge, physical facilities, terrain, climate, finances, and labor the cattle producer has.

Most ranch operators would say “yes” if asked the question, “Would you like to be better at what you do or what you are tomorrow, next week, and next year?” Would you give a “yes” answer?

The major problem that most cattle producers face in getting to where they want to be or where they want to go with their operation is that these objectives have not been answered clearly enough. Before you can really get on the road to where you want to go, you need to ask yourself some searching questions, and give yourself some honest answers.

Why are you in cattle ranching? Is it to use capital? Is it to employ yourself as a laborer? Is it to use your managerial skills? Is it to employ your family? Is it because you want to be an independent business person? Is it because you enjoy living in the country? Is it because you enjoy working with animals? Is it because you want to be identified with a romantic period in history?

You may have answered “yes” to all of these questions and justifiably so. They are all legitimate reasons for being in the cattle business. The priority that you place upon these reasons may have a bearing upon the return you receive to each of these reasons. This also will have an impact on the management philosophy that develops in your enterprise. For example, if you are in cattle ranching to employ members of your family, you may not want to become as labor efficient as possible. If you are in the cow business to use capital investments to get the most return possible, your philosophy of management will be quite different.

If you will identify why **you** are in beef cattle production and set goals to achieve the most return to your “why,” you will do a much better job of maximizing your returns.

Goals in the Beef Game

What would a football game be without a goal? What would be the point of interest in a basketball game without the little hoop of iron hung on a frame at each end of the gym? Goals give meaning, objective, or focus to things. They allow for achievement. They give order and stability to a game, a program — or life for that matter. With definite goals, “game plans” can be developed to achieve the goals.

Goals must have the following characteristics:

Be Clearly Defined and Firmly Fixed

They must be set, or clearly defined, and must remain firmly fixed. Can you imagine the frustration and anxiety of a basketball team or coach if the position of the goal were changed at any moment to another position on the court? Too often we are like this in our business objectives. We think somewhere down on the other end of the court there is a goal that we are going to make. But we are not real sure how we’ll count the points, what the goal will be, or where the end of the court is. Goals must be firmly fixed and identifiable.

Be Achievable

Let’s make another sports analogy. Would anyone play basketball or would basketball have any meaning if the goal were smaller than the ball or so high that no one could put the ball through the hoop? Of course not.

Have a Realistic Time Frame

Too often our goals are set with no time frame or with a time scheduled that is too narrow. Foreign visitors to this country frequently say that Americans are in too much of a hurry. We must be realistic in the time table we set for reaching our goals.

Let’s take a look at some overall goals of a beef enterprise. Most of these are attained at some level and are seldom listed as goals. Perhaps the first objective or “goal” is:

- **Return on Investments**—These investments are in land, feed, water, equipment, and other items required to operate a beef enterprise. In this day of high money costs, a return must be realized.
- **Provide Employment**—The enterprise could provide full-time employment or, as in the case of some beef operations, part-time employment. This can take the form of merchandising time that is otherwise unmarketable or labor time that is shared with other farm enterprises.
- **Use Resources**—This goal is often overlooked. It is established to use all of the energy derived from the land. It may be wasted ground such as ditch banks or drainage ditches. It may be using roughages in a crop rotation system or surplus feeds or our vast ranges for the grazing animals. The goal should be to use these resources to the fullest and still retain a maximum sustained yield of resources.
- **Personal Satisfaction**—If you won’t like cattle or if you don’t like the outside activities associated with cattle, then all other goals become much more elusive. One personal satisfaction that a herd of cattle can give is the opportunity to associate with other people with a common interest.
- **Achievement**—Though this is the last goal listed here, it is perhaps more important than all others, and is the basic reason for establishing intermediate goals. There must be some sense of achievement before one

can do well in anything. These achievements are reached by knowing you are making things better than they were. You are able to try new ideas or can set production (intermediate) goals and achieve them by your own plans and efforts.

Intermediate goals are the short-range objectives that, if we achieve successfully, move us closer to our main goal. In setting intermediate goals you are able to measure progress and achieve a sense of accomplishment.

The value of intermediate goals, again, may be explained by a football game analogy. A football team may be 70 yards from scoring a touchdown. Its ultimate goal is to win by scoring more points than the opposition. Team members know that touchdowns are seldom made on 70-yard plays. The game plan from that position on

the field calls for a series of first downs. The intermediate goal is to make another first down and continue to do so until the team is in scoring range. So the team's intermediate goals become not 6 points, but a series of first downs that will lead to scoring the touchdown or 6 points and achieving the goal.

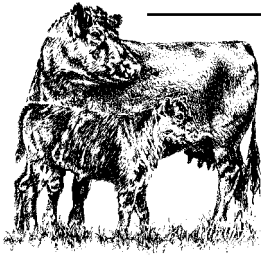
The long range goals you set for your operation will depend on your answer to the original question, "Why are you in cattle ranching?" Don't forget that you also have to set some intermediate goals to measure your progress and to give you a sense of achieving.

Hopefully, this collection of materials and the Management Guide will help you reach your goals and give you the greatest possible returns to your **why** for being in cattle ranching.



©2001

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, by the Cooperative Extension Systems at the University of Arizona, University of California, Colorado State University, University of Hawaii, University of Idaho, Montana State University, University of Nevada/Reno, New Mexico State University, Oregon State University, Utah State University, Washington State University and University of Wyoming, and the U.S. Department of Agriculture cooperating. The Cooperative Extension System provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws. Second edition; January 2002 Reprint



Western Beef Resource Committee

Cow-Calf Management Guide

Management Guide Section

CL109

How to Use the Total Beef Program Management Guide & Cattle Producer's Library

*J D Mankin, Former Extension Animal Scientist
University of Idaho*

This management guide is arranged to deal with the biological cycle of the cow and those things that are critical to each stage of that biological cycle. It is arranged also to suggest some management guidance at the times when certain "action" is taking place on the ranch.

The Management Guide is arranged to remind you of:

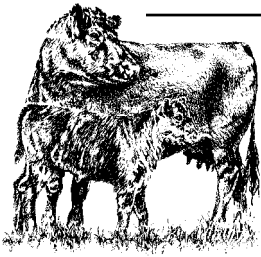
1. **The objective of the particular biological cycle or set of activities.** Having a written objective for these activities makes it much easier for you to monitor the management level to keep the program going in the direction you want it to go. Periodically examine what is going on at a given biological cycle to see if all is being done that is important to the objective.
2. **The important consideration for the objective.** Listed under the objective are some important concerns for this stage of the biological cycle that have a bearing on the outcome of activities at this time. These statements are enlarged upon in the fact sheet listed in the Cattle Producer's Library.
3. **Good management practices.** These are activities that good managers are doing during this particular biological cycle to keep the program in line with the objective. The Cattle Producer's Library fact sheet, indicated by a CL number, will give information on why this is a good practice at this time.
4. **Suggestions for planning ahead for the next biological cycle or set of activities.** This section is a reminder that there is an important time period coming up and that certain things need to be done now. Doing these now and planning ahead will make management to reach the next objective much easier.
5. **More information about each Management Guide statement.** Read the reference fact sheet in the Cattle Producer's Library. As you use the information in the fact sheets, your management to reach the objectives will be much more effective.

Remember, this is a guide to your management plan. Where it doesn't fit, write in recommendations for your ranch, taking into consideration "Mother Nature's facts."



©2001

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, by the Cooperative Extension Systems at the University of Arizona, University of California, Colorado State University, University of Hawaii, University of Idaho, Montana State University, University of Nevada/Reno, New Mexico State University, Oregon State University, Utah State University, Washington State University and University of Wyoming, and the U.S. Department of Agriculture cooperating. The Cooperative Extension System provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws. Second edition; January 2002 Reprint



Cow-Calf Management Guide

VII. Replacement Heifers

Management Objective —Select and grow heifers to produce cows that will have long, productive lives.

Points to Remember

- To complete growth to maturity on schedule, heifers need extra care until their second calf. **CL300, 310, 315, 333**
- The number of heifers selected now will dictate the number of cows that can be culled a year from now. **CL732, 735, 745, 1024**
- Heifers too small when selected will never have a long and productive life. **CL410, 745, 775**
- Heifers large at weaning will retain their advantage throughout life with proper care. **CL410, 745**
- Proper feeding the first winter is critical to heifer development. **CL300, 303, 333, 745**
- Early cycling in heifers depends on age and weight. **CL300, 745**
- Heifers calving the first calving period will out-produce cows calving the fourth calving period. **CL410**
- Heifers require more time to start cycling after calving than mature cows. **CL300, 413**
- The more heifers that can be selected from, the greater the opportunity for improvement. **CL932, 1020, 1024, 1035**

- Begin a herd vaccination schedule and provide sufficient boosters. **CL212, 605, 607, 650, 654, 655, 659, 662, 663, 671, 672, 675, 681, 683**

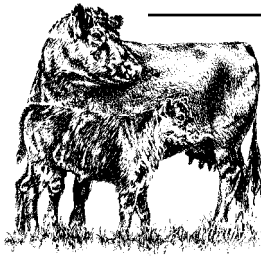
Good Management Practices

1. Keep heifers separate during winter, and provide extra feed from weaning until their second calf. **CL300, 303, 306, 745**
2. Keep enough replacements so that any cow that needs culling can be culled. **CL735, 745, 932, 965**
3. Cows calving beyond 60 days in the calving season should be replaced with heifers calving the first 20 days. **CL410, 735, 745, 747**
4. Calve heifers 20 days ahead of the cow herd to allow them more time to begin cycling before the breeding season begins. **CL448, 745**
5. Use bulls that produce fewer calving problems. **CL421, 425, 1020, 1024, 1037, 1038, 1040, 1041**



©2001

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, by the Cooperative Extension Systems at the University of Arizona, University of California, Colorado State University, University of Hawaii, University of Idaho, Montana State University, University of Nevada/Reno, New Mexico State University, Oregon State University, Utah State University, Washington State University and University of Wyoming, and the U.S. Department of Agriculture cooperating. The Cooperative Extension System provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws. Second edition; January 2002 Reprint



Cow-Calf Management Guide

Total Beef Program Troubleshooting Guide

*Pat Momont, Extension Beef Specialist
University of Idaho*

In the cow-calf operation, total pounds produced is a function of three things: (1) the number of individual animals involved, (2) the rate of gain of the individuals, and (3) the time period in which the gain is made. Problems of reproduction and survival affect the total number of individual animals that are marketed. Reproductive problems are an expression of many management forms. With all things being equal, you would expect the greatest economic return to come from the cow with the oldest calf.

Again all things being equal, weight and growth are a function of time. Therefore, the objective of the breeding program would be to get all cows bred as early in the breeding season as possible.

In a well-managed herd, 75 to 80 percent of the cows will settle to first service, another 15 to 20 percent will settle in the second 21 days, and 5 to 7 percent will be open at the end of two heat periods. When calving season becomes longer than this, the following causes may be part of the problem.

| Reproductive problem | Possible causes | Solution |
|--------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------|
| Heifers | | |
| Do not show estrus | Heifers not sexually mature | CL410, 442, 745 |
| | Inadequate plane of nutrition (Could be energy, protein, minerals, or vitamins) | CL300, 303, 306, 331, 333, 629 |
| | Too small at weaning | CL745, 793 |
| Do not settle | Reproductive disease | CL661 |
| | Infertile bulls | CL435, 436 |
| | Poor A.I. technique | CL404, 406 |
| High incidence of calving difficulty | Not developed enough before breeding | CL316, 402, 410, 745, 747 |
| | Not fed adequately after breeding | CL300 |
| | Birth weight of sire line too high. | CL1024, 1037, 1038 |

| Reproductive problem | Possible causes | Solution |
|--------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Cows | | |
| Do not show estrus | Inadequate plane of nutrition last trimester of pregnancy | CL303, 306, 330, 331, 413, 1110, 1120, 1130 |
| | Inadequate plane of nutrition postcalving (Could be energy, protein, minerals, or vitamins) | CL300, 303, 306, 315, 330, 413, 629, 1110, 1120, 1130, 1170 |
| Do not settle | Postcalving interval not long enough | CL404, 406, 410, 413 |
| | Disease or injury at calving | CL660 |
| Do not settle | Reproductive disease | CL660, 661 |
| | Uterine infection | CL660, 681 |
| | Infertility or low fertility of bulls | CL425, 659 |
| | Bulls not traveling through herd | CL436 |
| Abortion | Reproductive diseases such as brucellosis, leptospirosis, etc. | CL632, 636, 661, 662, 663, 681 |
| Bulls | | |
| Not settling cows | Insufficient number of bulls | CL436 |
| | Immature bulls | CL421, 425 |
| | Infertile bulls | CL424, 425, 659 |
| | Crippled bulls | CL425, 435, 436 |
| | Abnormal reproductive system | CL424, 425 |
| Calving difficulty | Birth weight of sire line too high | CL446, 1024, 1037, 1038 |
| Deformities | Genetic defects | CL1026 |
| Artificial insemination | | |
| Poor conception | Poor semen | CL404, 406, 425 |
| | Poor A.I. techniques | CL404, 406 |
| | Poor embryo transfer technique | CL408 |
| | Cows not in good condition | CL330, 331, 720 |
| | Postcalving interval not long enough | CL404 |
| | Disease | CL661 |
| | Failure to detect estrus | CL404 |

Beef reproduction at the commercial cow-calf level in its simplest definition is growth management. For efficient growth management, the growth of the individuals that make up the total production must be

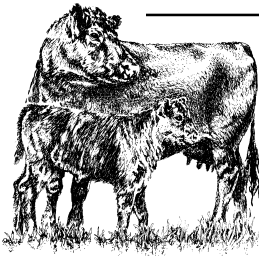
evaluated in terms of what could be achieved and what was achieved. In cow-calf production, this is usually expressed as average weaning weights at about 331 days.

| Growth problems | Possible causes | Solution |
|------------------------------------------------------------|-----------------------------------------------------|------------------------------------------------------------------------------|
| Cow condition poor | Inadequate nutrition | CL300, 303, 306, 315, 330, 331, 333, 720, 747, 1110, 1120, 1130, 1170 |
| | Heavy internal parasite infestation | CL690 |
| | Heavy milking cows in relation to nutritional level | CL300, 330, 747 |
| Light weaning weight average | Poor milking mothers | CL720, 1037 |
| | Nutritional | |
| | 1. Poor pasture or range | CL530, 535, 540, 542, 545, 546, 560, 594, 596 |
| | 2. Low level of total feed | CL300, 500, 502, 545 |
| | Wrong calving season in relation to feed source | CL311, 316 |
| | Disease | |
| | 1. Scours | CL601, 648, 685 |
| | 2. Respiratory | CL601, 607, 675 |
| | Internal parasites | CL690, 691 |
| | Wide age variation (long calving season) | CL331, 410 |
| | Drought year | CL560, 1100, 1110, 1130, 1140, 1150, 1180 |
| | Nonuse of implants | CL755 |
| | Genetic | |
| 1. Small frame | CL1002, 1038 | |
| 2. Breeding program | CL1002, 1038 | |
| Weak calves or high death loss in newborn and young calves | Scours | CL601, 602, 605, 648, 649, 685 |
| | Dystocia | CL447, 448, 450 |
| | Clostridial diseases | CL600, 605, 654 |
| | Nutrition of dam | CL315, 330 |
| | Not receiving colostrum | CL448 |



Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, by the Cooperative Extension Systems at the University of Arizona, University of California, Colorado State University, University of Hawaii, University of Idaho, Montana State University, University of Nevada/Reno, New Mexico State University, Oregon State University, Utah State University, Washington State University and University of Wyoming, and the U.S. Department of Agriculture cooperating. The Cooperative Extension System provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws. Second edition; January 2002 Reprint

©2001



Western Beef Resource Committee

Cow-Calf Management Guide

Quality Assurance Section

CL213

Food Safety and Quality Assurance From the Farm to the Table

Kevin Heaton, Utah State University Extension

Food safety has become an important issue in today's society. Lives have been lost, companies have gone bankrupt, and employees have lost their jobs because of foodborne illness outbreaks. In order to ensure the safety of meat products, the Federal Meat Inspection Service has initiated such programs as Hazard Analysis Critical Control Point (Sanitation Standard Operating Procedures) and Zero Tolerance in all slaughter and processing plants. Realizing this is not enough, researchers and government agencies are trying to find ways to implement these programs from the farm to the table.

Most food safety outbreaks are traceable to the processing or slaughterhouse but cannot be traced to individual feedlots or ranches. Outbreaks of foodborne illness become headlines in every form of media. There is a correlation between the numbers of outbreaks linked to ground beef and the demand for beef. Therefore, livestock producers should be interested in finding methods to prevent pathogenic bacteria at the farm level and be aware and supportive of advances in technology that ensure safe food. However, producers should realize that the only payback would be fewer illnesses, increased consumer confidence, and increased demand for beef.

Foodborne Illness

Consumers in the United States have the safest food, including meat, in the world. Even though many activities, such as driving or swimming, are much more life threatening than eating a meat product, modern consumers want zero chance of becoming sick from their food.

Consumers will buy food they believe to be safe. However, when an outbreak of foodborne illness occurs, consumers nationwide will avoid the associated food product. As beef producers we must understand and be aware of the major food pathogens that our healthy livestock could be harboring. Several patho-

genic bacteria live in the intestinal tract of healthy livestock including *Erscherichia Campylobacter* sp. and *Salmonella* sp.

***Erscherichia coli* 0157:H7**

Since the early 1980s, *E. coli* 0157:H7 has caused serious illness in humans who have eaten undercooked ground beef. *E. coli* 0157:H7, a gram negative rod that produces shiga-like toxin(s), causes acute bloody diarrhea, abdominal cramps, and hemolytic uremic syndrome (which may develop into chronic kidney failure or neurological impairment). Death occurs in approximately 3 to 5 percent of the persons with *E. coli* 0157:H7 (Center for Disease Control and Prevention 2000).

Product contamination occurs during the skinning and eviscerating part of the slaughter process. Interestingly enough, *E. coli* 0157:H7 outbreaks have increased in recent years. This doesn't necessarily mean that the problem has increased, but rather that the technology to detect the disease in humans has improved, thus increasing the number of reported cases. In actuality, increased frequency of testing, improved slaughter processes, and stringent food safety programs provide consumers with the safest meat products to date. However, a serious pathogen outbreak can mean economic loss to the livestock and meatpacking industries.

At this time it is unknown how livestock become carriers of *E. coli* 0157:H7. Bacteria can be spread from one animal to a whole herd, from wildlife (deer) to cattle, or from cattle to deer (Sargeant et al. 1999). Sporadic in-livestock *E. coli* 0157:H7 ranges from 0 to 28 percent infection rates in individual herds, has the highest rates in the summer months, and has not been linked to sick or injured animals (Hancock et al. 1997a). Manure application to forage crops has had little effect on the incidence of *E. coli* 0157:H7. It can survive for almost two years in manure, which provides reason enough to manage manure properly (Hancock et al. 1997b; Kudva et al. 1998).

Salmonella sp.

The infamous *Salmonella* sp. are small, gram negative, non-sporing rods, which have been recognized as a leading cause of gastroenteritis in humans for over 100 years. *Salmonella* is widely dispersed with humans and animals being the primary hosts. Although, the majority of illnesses have been linked to poultry and poultry products, livestock can harbor the bacteria, which can contaminate meat products during processing. One study discovered that 45 percent of the rumen contents of healthy cattle were found to have *Salmonella* (Grau and Brownlie 1986). In addition, livestock feeds are high in *Salmonella* sp., with an incident rate of 49 percent (Graber 1991). The Food Safety Inspection Service has initiated a *Salmonella* testing program for cow and bull slaughter plants and for ground beef processing plants.

Campylobacter

Campylobacter sp. are an important cause of foodborne illness and may be the greatest cause of acute bacterial diarrhea in humans. A major percentage of meat animals have been known to carry the organism in their intestinal tracts. One study indicates that 80 percent of dairy operations and almost 40 percent of individual livestock are positive with the organism (Wesley et al. 2000). This bacteria contaminates many different types of raw meats and traditionally has not been well understood. Recent advances in technology have made it easier and more cost effective to test *Campylobacter* sp. in raw meat products. Control of this organism will become more important in the future.

Control of Pathogenic Bacteria

Current control methods of pathogenic bacteria have been at either the processing facility or the consumer level. Many processors use top-of-the-line technology, such as hot water or steam pasteurization cabinets, steam vacuums, pre-evisceration wash with organic acids, organic acid rinse cabinets, antimicrobial additives, and efficient chilling systems. The Food and Drug Administration's approval of irradiation of meat should decrease the incidence of foodborne illness.

A vaccine or feed additive is the most logical control method to prevent pathogenic bacteria at the farm or ranch level. A feed additive that looks promising for control of *E. coli* 0157:H7 and *Salmonella* sp. is sodium chlorate. Sodium chlorate could be added directly into the drinking water shortly before slaughter. Recent research shows this would reduce pathogenic bacteria 150-fold, is inexpensive, and causes no adverse effects to the animal (McGraw 2001).

Good sanitation practices are beneficial in preventing the spread of pathogenic bacteria. Regular cleaning of watering troughs, maintaining a clean water source, having a good pest (fly) control program, and protecting feed from rodents and birds will help prevent foodborne illness at the farm level.

Educating the consumer about foodborne illness is important. Consumers know that they must cook chicken thoroughly or there is a high probability of contracting Salmonellosis. Yet, it is still a common practice to eat ground beef products rare. Educating the consumer to cook ground beef products to 165°F (well done) is a must and will be a continual process. The Safe Handling Instructions are helping to educate consumers. The following label must appear on all retail meat products:

Safe Handling Instructions

This product was prepared from inspected and passed meat and/or poultry. Some food products may contain bacteria that could cause illness if the product is mishandled or cooked improperly. For your protection follow these safe handling instructions. Keep refrigerated or frozen. Thaw in refrigerator or microwave. Keep raw meat and poultry separate from other foods. Wash working surfaces (including cutting boards), utensils and hands after touching raw meat or poultry. Cook thoroughly. Keep hot foods hot. Refrigerate leftovers immediately or discard.

This statement is not intended to scare consumers away from raw meat products but it reminds them to use sanitary practices while handling meat products, thus preventing foodborne illness.

Foreign Objects Contamination

Foreign objects enter beef products during livestock processing, accidents, neglect, and poor management. Although very low incidence occurs, most foreign object contamination can be prevented or corrected with immediate response by removing the foreign object from the animal. Objects should be removed by veterinarians or other trained personnel. Buck-shot, injection needles, implant needles, scalpel blades, tranquilizer darts, archery broad heads, and .22 caliber and other bullets have been found inside meat during processing and consumption (Figs. 1, 2, and 3).

Buck-shot, bullets, and archery broadhead arrows can enter the animal from hunters or from cowboys who use pistols loaded with buck-shot to round up wild cattle in rough country. Accidents, such as breaking a needle



Fig. 1. A tranquilizer dart found imbedded next to the pelvis. Apparently, the animal was shot through the rectum.



Fig. 2. Four .22 caliber bullets, a broken scalpel, buckshot, an implant needle, and an unidentified object were all recovered from beef carcasses during processing.

while vaccinating livestock, are not uncommon. It is important that broken needles are removed from the animal.

Processing facilities have metal detectors that prevent larger objects from reaching the consumers. Small objects, such as buckshot, or nonmetallic objects, are difficult to prevent from reaching the consumers. Foreign objects cost processing companies millions of dollars in claims, condemned product, and downtime. Consumers lose confidence in beef products, and these costs are carried on to the producer indirectly through lower demand.

Conclusion

In comparison to other meats and raw meat products, ground beef and beef products typically have lower bacteria numbers. *E. coli* 0157:H7 is unique in that it requires very few bacteria to cause illness. In comparison, other pathogens require millions of bacteria to cause illness. Producers should be concerned about food safety issues and be supportive of research and technology that will help find solutions to the problems. Currently, producers can use good management practices, such as maintaining good pest control, cleaning water troughs regularly, and maintaining a clean water source. Also, producers should support new technology and food safety education efforts.



Fig. 3. Two injection needles found in beef carcasses.

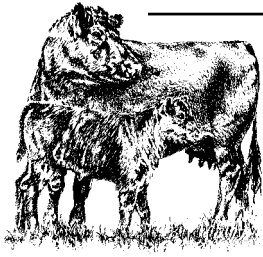
References

- Center for Disease Control and Prevention. 2000. *Escherichia coli* 0157:H7. Technical Information. http://www.cdc.gov/ncidod.diseaseinfo.escherichiacoli_t.htm
- Graber, G. 1991. Control of Salmonella in animal feeds. Division of Animal Feeds, Center for Veterinary Medicine, Food & Drug Administration. Report to the National Advisory Commission on Microbiological Criteria for Foods.
- Grau, F. H., and L. E. Brownlie. 1986. Effect of some pre-slaughter treatments on the Salmonella population in the bovine rumen and feces. *J. Appl. Bacteriol.* 31:157-163.
- Hancock, D. D., D. H. Rice, D. E. Herriott, T. E. Besser, E. D. Ebel, and L. V. Carpenter. 1997a. Effects of farm manure handling practices on *Escherichia coli* 0157:H7 prevalence in cattle. *J. Food Prot.* 60:4 p. 363-366.
- Hancock, D. D., T. E. Besser, D. H. Rice, and D. E. Herriott. 1997b. A longitudinal study of *Escherichia coli* 0157 in fourteen cattle herds. *Epidemiol. Infect.* 118 p. 193-195.
- Kudva, I. T., K. Blanch, and C. J. Hovde. 1998. Analysis of *Escherichia coli* 0157:H7 survival in bovine manure and manure slurry. *Appl. Env.* 64:9 p. 3166-3174.
- McGraw, L. 2001. Reducing Salmonella and *E. coli* 0157:H7 at the farm. *ARS News and Information.*
- Sargeant, J. M., D. J. Hafer, J. R. Gillespie, and R. D. Oberst. 1999. Prevalence of *Escherichia coli* 0157:H7 in whitetailed deer sharing rangeland with cattle. 215:6 p. 792-794.
- Wesley, I. V., S. J. Wells, K. M. Herman, A. Green, L. Schoeder-Tucker, M. Glover, and I. Siddique. 2000. Fecal shedding of *Campylobacter* *Arcobacter* in dairy cattle. *Appl. Env.* 66:5, p.1994-2000.



©2001

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, by the Cooperative Extension Systems at the University of Arizona, University of California, Colorado State University, University of Hawaii, University of Idaho, Montana State University, University of Nevada/Reno, New Mexico State University, Oregon State University, Utah State University, Washington State University and University of Wyoming, and the U.S. Department of Agriculture cooperating. The Cooperative Extension System provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws. Second edition; Fall 2001 Update



Cow-Calf Management Guide

Reading a Feed Label

*Michael J. Mehren, Livestock Nutritionist
Northwest Research & Nutrition, Hermiston, Oregon*

Livestock feed labels provide a guaranteed analysis of the product described. If the feed is MEDICATED a certain set of regulations apply. Non-medicated feeds must also conform to a certain set of standards. The following example is used to describe the different parts of the label.

Medicated Feed Label

Medicated feed label requirements will be addressed first.

The feed label shown has its parts numbered for ease in explanation.

1. If the product contains any feed additive such as an antibiotic, growth promotant, or dewormer the term MEDICATED must be included immediately after the name of the product.
2. This part is for a statement describing the animal for which the feed is designed and the effect of the medication. In this example the product is for beef cattle on pasture, and the purpose is to increase rate of gain.

BEEF BUDDY WITH BOVATEC

1. MEDICATED.
2. FOR BEEF CATTLE ON PASTURE. FOR INCREASED RATE OF WEIGHT GAIN.
3. LASALOCID 60 GRAMS/TON
7. GUARANTEED ANALYSIS

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> a. Crude protein, minimum 14% b. Equivalent protein from NPN, Maximum 3% c. Crude fat, minimum 1.5% d. Crude fiber, maximum 14% e. Calcium, maximum 2% Calcium, minimum 1% Salt, maximum 2% Salt, minimum 1% f. Phosphorus, minimum 1% g. Vitamin A, minimum I.U./lb 25,000 | <ol style="list-style-type: none"> h. Selenium, minimum ppm 0.99 Zinc, minimum ppm 500 Copper, minimum ppm 150 i. INGREDIENTS Processed grain by-products, plant protein products, grain products, forage products, molasses, dicalcium phosphate, calcium carbonate, salt, urea, magnesium oxide, zinc oxide, manganous oxide, copper sulfate, calcium iodate, cobalt carbonate, sodium selenite, Vitamin A supplement, artificial flavors, ethoxyquin (a preservative). j. NET WEIGHT 50 LB (22.6 kg) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
4. FEEDING DIRECTIONS: Beef Buddy Medicated is designed as a supplement for cattle on pasture or range. Feed continuously at a rate of 2 to 6.67 pounds daily to provide 60 to 200 milligrams of Lasalocid.
5. CAUTION: The safety of lasalocid in unapproved species has not been established. Do not allow horses or other equines access to lasalocid as ingestion may be fatal.

Unlimited roughage in the form of hay or pasture, and fresh, clean water should be provided at all times.

Manufactured by: My Feed Company, Box 000, Rural, Oregon 97000.

3. This part has the chemical name of the drug and the amount present. This example product contains Lasalocid at 60 grams/ton. The concentration of the medication dictates the amount that should be fed.
4. Feeding directions are explained. These are provided so that the livestock receive the proper amount of medication each day. Feeding directions should be closely followed to avoid any chance of an adverse reaction to the medication or a drug residue in the carcass upon slaughter.
5. CAUTION makes the user aware of management considerations. The feed shown would be toxic to horses or other equines. Other cautionary statements may stress the importance of proper mixing or limit feeding.

Some medicated feeds require a withdrawal before slaughter. This is needed to prevent any possibility of a residue in the meat. Examples would include products containing a combination of chlortetracycline and sulfamethazine used in preventing respiratory disease or fenbendazole, which is fed to de-worm cattle. The label will include a statement headed by the term "WARNING" or "LIMITATIONS" to alert the user that special handling is required.

Non-Medicated Label

The remainder of the label deals with nutrient content, ingredients that are used, and net weight. This information is provided whether the feed is medicated or not.

7. Guaranteed analysis, ingredients, and net weight.
 - a. The crude protein minimum must be guaranteed for those products claiming to be a source of protein. A mineral supplement does not require a protein guarantee.
 - b. If the product has any added source of non-protein nitrogen (NPN) such as urea, ammonium phosphate, or biuret then this is listed directly under the crude protein content and noted as equivalent protein from NPN. The maximum amount must be declared.

Urea is by far the most common source of NPN. The amount shown in the example lists 3 percent. This does NOT mean the product has 3 percent urea. Feed grade urea has the equivalent of 281 percent protein, therefore approximately 1 percent urea would provide 3 percent protein equivalent ($0.03 \text{ divided by } 2.81 = .01$). See CL 314 for a discussion on effective NPN use.
 - c. Crude fat is guaranteed because fat is the highest source of TDN. A product having 10 percent fat would have significantly more energy than one having 1.5 percent fat. Grains and forages range from 1 to 4.5 percent fat.
 - d. Crude fiber must be guaranteed as a maximum. It

is the least digestible of the carbohydrate fraction of feed. The tendency is to criticize supplements that have crude fiber over 10 percent; the belief is that the TDN (or energy) is substantially lower than those having crude fiber content of 4 to 7 percent. However, ingredients such as beet pulp, wheat midds, and soy hulls have highly digestible fiber. Using crude fiber for energy determination gives unreliable results.

- e. Calcium and salt must specify a minimum and maximum amount in the formula. Both calcium and salt are inexpensive ingredients, and the amount included should serve a nutritional purpose rather than just serve as an inexpensive filler. A high level of calcium might be justified in a finishing supplement that will be fed with a high percentage of grain and a minimal amount of hay.

Salt can be used to attract animals to a free choice supplement and deter intake of the same supplement depending on the amount added. See CL 312 for a discussion on salt limiting. If magnesium or potassium is added, the minimum amount, expressed in percent, should be guaranteed.
- f. The minimum amount of phosphorus is specified. Phosphorus is quite expensive, and the difference in cost between a product having 5 vs. 10 percent phosphorus is substantial. Knowing the phosphorus content of your feed will aid in purchasing the minimum amount of supplemental phosphorus needed.
- g. The minimum amount of Vitamin A in international units per pound is guaranteed. Mature and dry forages are quite low in Vitamin A. Most supplements fed at or near calving, or when animals are on dry feed, include Vitamin A as insurance against a deficiency.
- h. If the product is a mineral and includes the trace minerals zinc, copper, and selenium, the amounts of these minerals must be guaranteed in parts per million (ppm). The amount of selenium included must correspond with the recommended feed intake to ensure that the animal receives the proper daily amount. For example, a supplement designed for 1 pound daily intake would guarantee 6.6 ppm selenium, while one made for 1 1/2 ounces intake would guarantee 66 ppm. Each would provide 3 milligrams of selenium daily when fed according to directions.
- i. As can be seen in the list of ingredients, feed manufacturers are allowed to use generic terms such as plant protein products, forage products, and processed grain products. This is done to allow flexibility in formulation and cost control for the manufacturer. However, it prevents the user from determining the quality of the product.

Ingredients are listed by amount in the feed, first being most. Without a description of each ingredient and the amount included, a calculation of the TDN or energy cannot be made. The reputation of the manufacturer and user experience are the best measures of product quality.

Most states also conduct routine testing of manufactured feed. A copy of the report is available from the State Department of Agriculture, a feed manufacturer consistently missing label guarantees would be suspect of providing inferior products.

- j. Net weight of the product is guaranteed.

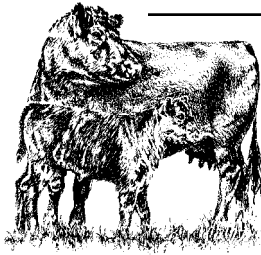
Summary

To effectively use the label information requires several other factors. The weight, age, body condition, weather, and production goal for the cattle establish the nutrient requirements. An analysis of the available feed, whether hay, silage, range, or pasture, provides input of the nutrients available and those that are deficient. Then label and cost can be used to determine if the product under consideration provides those supplemental nutrients at an affordable cost. See CL 303 and 304 for a discussion on supplemental needs and techniques used in selecting a supplement.



©2001

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, by the Cooperative Extension Systems at the University of Arizona, University of California, Colorado State University, University of Hawaii, University of Idaho, Montana State University, University of Nevada/Reno, New Mexico State University, Oregon State University, Utah State University, Washington State University and University of Wyoming, and the U.S. Department of Agriculture cooperating. The Cooperative Extension System provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws. Second edition; January 2002 Reprint



Cow-Calf Management Guide

The Biological Cycle of the Beef Cow

Revised by¹

D. L. Hixon, Beef Cattle Extension Specialist
D. W. Sanson, Ruminant Nutrition Extension Specialist
University of Wyoming

In a broad sense, it starts with fertilization and ends with the weaning of a calf. In the latter case, the beef cow's reproductive cycle overlaps in a chronological year. This is the perspective of the reproductive cycle that will be discussed in this publication.

Successful beef cattle production depends on proper management of the biological cycle to attain stable production. To enhance production stability, we must understand and appreciate the needs of the cow as she progresses through her biological cycle. Feed resources produced on the ranch and/or farm should be managed to most economically meet the cow's biological needs.

The biological cycle of the beef cow is constant and rather well-defined. Duration of pregnancy is approximately 282 days with variation between breeds and individual cows within breeds. The biological cycle can be divided into four definite periods and one variable period:

| Period | Duration in days |
|--------------------------------|------------------|
| First trimester of gestation | 94 |
| Second trimester of gestation | 94 |
| Third trimester of gestation | 94 |
| Postpartum period (rebreeding) | <u>83</u> 365 |
| Pre-weaning period | (variable) |

The first trimester begins on the day the cow is serviced and conceives. The biological cycle remains constant but the chronological cycle will vary according

to the date the cow is bred. The accompanying "beef cow biological-chronological wheel" will show how the biological cycle and the chronological cycle coincide. For example, the biological and chronological cycle of a cow bred June 1 would be:

| Biological cycle | Chronological cycle |
|------------------|----------------------------------------------------------------------|
| Day 1 | June 1 — bred and conceived |
| Day 94 | Sept. 3 — end of first trimester |
| Day 188 | Dec. 6 — end of second trimester |
| Day 282 | March 10 — end of third trimester (birth of calf) |
| Day 365 | May 31 — end of postpartum period and beginning of next gestation |
| Day 488* | Oct. 1 — calves weaned** |

If a cow conceived on June 23, the biological cycle would remain constant but the chronological cycle would vary. This is seen as you adjust the "beef cow biological-chronological wheel."

The biological cycle and the chronological cycle are important to the producer of beef cattle. Factors affecting the various biological periods will be explored more in other parts of the Cattle Producer's Library (see CL308, 331, 402). However, these few points are presented for consideration now:

Points to Ponder

1. If a cow is to conceive and calve every 365 days, she must do so within the time frame of the biological cycle.

¹Original authors were C. O. Schoonover and David Yates, retired and former University of Wyoming specialists, respectively.

*A calf born March 10 would be 205 days old October 1.

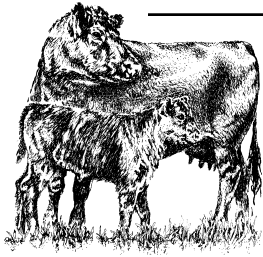
**Weaning dates will vary as will calf age at weaning.

2. Management strategies should complement the various periods within the biological cycle.
3. Management determines the chronological cycle by selecting the calving season and thus the breeding date.
4. Since not all cows are bred the same day, the chronological cycle will vary for cows within the same herd.
5. The shorter the breeding season, the more efficient management strategies will be for all cows.
6. Since beef cows mother calves until weaning, the biological cycle overlaps the chronological cycle.



©2001

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, by the Cooperative Extension Systems at the University of Arizona, University of California, Colorado State University, University of Hawaii, University of Idaho, Montana State University, University of Nevada/Reno, New Mexico State University, Oregon State University, Utah State University, Washington State University and University of Wyoming, and the U.S. Department of Agriculture cooperating. The Cooperative Extension System provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws. Second edition; January 2002 Reprint



Cow-Calf Management Guide

Designing Your Grazing System

*Jeffrey C. Mosley, Assistant Professor of Range Resources
University of Idaho*

A grazing system is a particular way of managing the interactions between plants, soils, and grazing animals. If you graze cattle, you already have a grazing system of some kind. As you begin to design or redesign your grazing system, remember that any grazing management problem usually has many possible solutions and very few things you can do are “right” or “wrong.” Most of all, remember that no one grazing system is “best.”

Most grazing management problems can be solved by reducing them to a formula of simple fundamentals or principles. To be successful, you will need to creatively combine these principles into a grazing plan designed specifically for your operation’s unique circumstances. **Your** grazing system will be your particular way of managing your plants, soils, and grazing cattle.

Grazing Management Principles

Timing of Grazing: Avoid repeated grazing during critical stages of plant growth. The most critical stages are when plants are initiating new growth. This includes new growth in the spring or fall and midseason regrowth after grazing. New plant growth requires energy from the plant, and the plant needs a chance to replenish the energy used. To produce energy, the plants need ungrazed leaf tissue. Also, avoid grazing when soil moisture is too high and soils are more susceptible to trampling damage.

Frequency of Grazing: Avoid grazing too often during a single growing season. If given an opportunity to regrow and replenish its energy stores, a plant can be grazed several times during one growing season. If grazing is too infrequent, some plants will become “choked” by too much dead material, and subsequent plant growth will be restricted. Too-long ungrazed periods will also cause the forage’s nutritional quality to decline.

Severity of Grazing: Avoid removing too much of a plant’s leaf area. Leaves are the main sites of energy

production for the plant. If too little leaf area remains after grazing, the plant will be unable to regrow and replenish its energy reserves. Also, leave enough plant material to hold the soil in place and to protect the plant’s roots and stem bases from excessive cold or heat.

Season of Grazing: Avoid grazing an area at the same time of year, year after year. Some plants can cope with this better than others (e.g., crested wheatgrass), but varying the season of grazing from year to year is recommended for most kinds of plants. If altering the grazing season is not possible, you may need to reduce the severity or the frequency of grazing. Grazing during winter dormancy may help reduce buildup of dead plant material.

Type of Cattle: Graze the type of cattle best matched with the kind of forage available and its nutritional quality. For example, dormant forage will not meet the high nutrient requirements of growing yearlings. You should also match the type of cattle to your area’s topography. Cows with calves, for example, usually will not use steep topography as fully as dry cows or yearlings. Use the type of cattle accustomed to your environment. Cattle raised on flat, open grasslands usually do not adapt well when relocated to steep or timbered grazing lands. An animal’s previous grazing experience should also be considered when purchasing new animals. This is because cattle unfamiliar with the kind of plants in a pasture usually will not perform as well as cattle that previously have grazed similar forages.

Number of Cattle: This is probably the most important decision with any grazing system. Too many animals will cause cattle performance to decline, but the soil and vegetation will have deteriorated **before** animal performance begins to suffer. Most grazing systems that include strategically timed ungrazed periods during the growing season will, over time, support more animals than grazing systems where pastures are grazed continuously throughout the growing season.

Cattle Distribution: Prevent large numbers of cattle from congregating, especially on sensitive areas such as along streams. If cattle are causing soil or plant damage, it is often a problem of poor animal distribution rather than too many animals.

Grazing Selectivity: Cattle make choices and select those plant species and plant parts they find the least objectionable. Grazing systems can affect the extent to which cattle are allowed to graze selectively. Maximum individual animal performance will result when cattle are allowed to be the most selective in choosing their forage. Individual animal performance will drop below maximum whenever cattle are forced to graze less selectively. Non-selective grazing is appropriate when the objective is to prevent plants from becoming too coarse or “wolfy.” Care should be used with the non-selective approach because forced grazing of unpalatable plants usually first results in heavy grazing of any palatable plants in the pasture.

Additional Considerations

Number of Pastures: More pastures give you more flexibility and greater opportunity to control the timing, frequency, severity, and season of grazing. The optimal number of pastures will depend upon site conditions and your objectives. Good grazing management **can** occur under one-pasture management, but your ability to control grazing use is limited. Consequently, one-pasture management usually necessitates fewer animals.

Size of Pastures: Non-selective grazing usually requires small pastures grazed for short time periods with a high number of animals. If maximum selectivity is the goal, larger pastures with fewer animals are needed. Optimal pasture size will vary greatly. Extensively managed rangeland pastures may reach 10,000 acres or more in size, whereas intensively managed improved pastures may encompass 5 acres or less. The larger the pasture, the less control you will have over animal distribution.

Movement of Cattle Between Pastures: If cattle are moved infrequently, their performance will usually suffer when the herd is moved to a new pasture because the cattle will need time to become accustomed to their new surroundings. If cattle are moved more frequently between pastures, they usually become accustomed to the routine and need less time to adjust to new pastures. Movement between pastures can also depress animal gains when calves are separated from their dams. Thus, movements during calving season should be avoided. Whenever they are moved between pastures, animals should be jostled as little as possible.

Tailor System to Objectives: Design your grazing system with a clear set of objectives in mind. Don't copy someone else's system and then try to change your objectives to make them fit the grazing system. Your grazing system should be unique, reflecting your particular set of objectives and your unique set of economic, social, and environmental conditions.

Judge System by Objectives: Even the most well-developed grazing plan will continually require some adjustments. These adjustments should be based on how well your grazing system is meeting your objectives. As your objectives change, you'll need to reevaluate and probably adjust your grazing system.

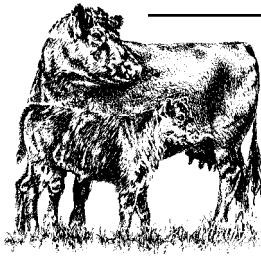
Summary Observations

1. Intensive rotational grazing systems that use many pastures per herd do not magically eliminate the need to practice all available management skills. In fact, these skills become even more important as your level of grazing management intensifies.
2. Cattle generally perform better under less intensive grazing systems, whereas forage plants are usually healthier under more intensive grazing systems.
3. Intensive grazing systems will usually improve unsatisfactory soil and vegetative conditions, but they usually will not greatly improve soil and vegetation that's already in satisfactory condition.
4. Because the conditions and objectives of your operation are unique, the economic outcome of a new grazing system can't be precisely known until after it is implemented. Therefore, be cautious when considering economic projections of changes to your grazing system.
5. Good grazing systems develop conditions for possible soil and vegetation improvement when favorable weather conditions occur. Several years may pass without improvement, but improvement will not occur unless plants and soil are in good health and capable of responding.
6. Flexibility is critical. Manage your pastures and animals according to the varying plant, animal, and economic conditions that exist, not according to specific calendar dates or pasture rotation schedules.
7. You are the key to success. Take advantage of any assistance offered by neighbors, consultants, or extension personnel, but don't let anyone else design your grazing system. If someone else designs your grazing system, undoubtedly it will fail. Remember that it's **your** grazing system and it's up to **you** to make it work.



©2001

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, by the Cooperative Extension Systems at the University of Arizona, University of California, Colorado State University, University of Hawaii, University of Idaho, Montana State University, University of Nevada/Reno, New Mexico State University, Oregon State University, Utah State University, Washington State University and University of Wyoming, and the U.S. Department of Agriculture cooperating. The Cooperative Extension System provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws. Second edition; January 2002 Reprint



Cow-Calf Management Guide

Halogeton Poisoning

*Ron Torell, Area Livestock Specialist, University of Nevada
Dr. James A. Young, USDA-ARS Scientist, Reno, Nevada
Dr. Bill Kvasnicka, State Extension Veterinarian, University of Nevada*

Halogeton glomeratus, an annual weed poisonous to sheep and cattle, was first observed in the United States near Wells, Nevada, in 1934. Halogeton now covers millions of acres in the United States. Cattle and sheep are susceptible to intoxication and death from consumption of halogeton, but cases of large scale poisoning of cattle are rare compared to sheep.

Most losses occur when hungry and thirsty animals are allowed to consume large amounts of halogeton. The toxic substance in halogeton is sodium oxalate, which is contained in leaves and other above ground parts of the plant. Halogeton is dangerous at all times. It becomes more toxic as the growing season advances, reaching a peak of toxicity at maturity. Livestock readily graze halogeton.

Grazing management for halogeton involves procedures to prevent accidental poisoning of the grazing animals, and management to encourage the density and vigor of competing perennial vegetation to biologically suppress halogeton.

Where and When It Grows

Halogeton often grows along railroad beds, roads, trails, and in other places where the soil has been disturbed. Dense stands are found on burned-over areas, overgrazed ranges, dry lakebeds, and abandoned dry farms. It thrives in the saline soils of colder semiarid regions—especially where native plant cover is sparse. Halogeton, however, lacks the capacity to compete with vigorous perennial plants and the more aggressive annuals.

Halogeton is a prolific seed producer. Wind, water, animals, and vehicles spread seed. New plants estab-

lished from February to mid-August produce a seed crop before the growing season ends in November. Moisture and warm temperatures cause the seeds to germinate. Seeds may remain viable in the soil for 10 years or longer.

How It Affects Livestock

Halogeton is actually more toxic to cattle than sheep, but because of the free roaming behavior of cattle they seldom consume enough to become intoxicated (James 1971). Symptoms of toxic consumption of halogeton on winter ranges are cattle become stiff and walk with extreme difficulty when driven. Some cattle lay down and stay down for several days.

Given the right conditions, halogeton can be a sudden and important factor in cattle management. In 1962, ranchers in Elko County, Nevada, lost about 150 cows in one day to halogeton poisoning (Young et al. 1999). The cows were driven down an old sheep trail where there were moderate to high concentrations of halogeton. The presence of hoarfrost on the halogeton probably contributed to the consumption of the toxic weed by thirsty cattle.

Sheep can tolerate large amounts of halogeton if they eat other forage at the same time and if they have been acclimated to halogeton in their diet. About 12 ounces of halogeton dry matter will kill a sheep that has been without feed for a day or longer; 18 ounces are required to kill a sheep that has been feeding on other forage. The first signs of halogeton poisoning occur two to six hours after an animal eats a fatal amount; death usually occurs in nine to 11 hours.

How to Reduce Losses

Livestock losses may be reduced by maintaining range that supports good forage and by proper management of animals on halogeton-infested ranges. Supplemental feeding helps prevent halogeton poisoning when animals trail through or graze infested areas. Animals unloaded in halogeton-infested areas after shipment may benefit from supplemental feeding before grazing in the halogeton-infested areas. Avoid congregating and introducing animals in these areas.

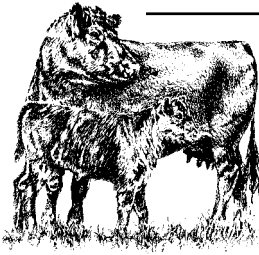
Livestock should not be placed into areas heavily infested with halogeton unless they can be introduced slowly to allow time for adaptation to the toxin. Always allow animals access to water. This can be accomplished by grazing areas with plants such as shadscale or light stands of halogeton. Livestock should not be allowed to become hungry or thirsty while grazing in areas infested with halogeton. Death in livestock occurs when an animal eats a large amount of halogeton in a short period of time. There is no known treatment for halogeton poisoning.

Because each halogeton plant produces vast numbers of seed, some of which may survive for 10 years or more in the soil, it is not practical to eradicate a plant population that has been in existence for two years or more. Plants can be held in control by proper use of herbicides, and small infestations can be eradicated if treated early. Revegetating infested rangelands with more desirable species of perennial grasses seems to be the most economical and practical method of controlling the spread of halogeton.

References

- Billings, W. D. 1945. The plant associations of the Carson desert region, western Nevada. *Bulter Univ. Botany Studies* 7:89-123.
- Cronin, E. H. 1973. Pregermination treatment of black seed of halogeton. *Weed Sci.* 21:125-127.
- Eckert, R. E., Jr. 1954. A study of competition between whitesage and halogeton in Nevada. *J. Range Manage.* 7:223-225.
- Gates, D., L. A. Stoddart, and C. W. Cook. 1956. Soil as a factor influencing plant distribution on the salt deserts of Utah. *Ecol. Monogr.* 26:155-175.
- James, L. F. 1971. Oxalate toxicosis. *Clinical Toxicology* 5:239-251.
- James, L. F., and E. H. Cronin. 1974. Management practices to minimize death losses of sheep grazing halogeton infested ranges. *J. Range Manage.* 27:424-426.
- Kinsinger, F. E., and R. E. Eckert Jr. 1961. Emergence and growth of annual and perennial grasses and forbs in soils altered by halogeton leachate. *J. Range Manage.* 14:194-197.
- Mathews, W. L. 1986. Early use of crested wheatgrass seedings in halogeton control. pp 27-28. *In: K. L. Johnson (ed.) Crested Wheatgrass Symposium.* Utah State Univ., Logan, UT.
- Miller, M. R. 1943. *Halogeton glomeratus*, poisonous to sheep. *Science* 97:227-229.
- Ralphs, M. H., and L. A. Sharp. 1988. Management to reduce livestock loss from poisonous plants. pp. 391-407. *In: L. F. James, M. H. Ralphs, and D. B. Nielson (eds.) The Ecology and Economic Impacts of Poisonous Plants on Livestock Production.* Westview Press, Boulder, CO.
- Robocker, W. C., M. C. Williams, R. A. Evans, and P. J. Torell. 1969. Effect of age, burial, and region on germination and viability of halogeton seeds. *Weed Sci.* 17:63-65.
- Tisdale, E. W., and G. Zappettini. 1953. Halogeton studies on Idaho ranges. *J. Range Manage.* 6:225-236.
- Williams, M. C. 1960. Biochemical analyses, germination, and production of black and brown seed of *Halogeton glomeratus*. *Weeds* 8:452-461.
- Young, J. A. 1988. The public response to the catastrophic spread of Russian thistle (1880) and halogeton (1945). *Agr. History* 62:122-130.
- Young, J. A., and R. A. Evans. 1979. Barbwire Russian thistle seed germination. *J. Range Manage.* 32:390-394.
- Young, J. A., and D. McKenzie. 1982. Rangeland drill. *Rangelands* 4:108-113.
- Young, J. A., and F. Tipton. 1990. Invasion of cheatgrass into arid environments of the Lahontan Basin. pp 37-41. *In: McArthur, E. D., Romney, E. V., Smith, S. D., and Tueller, P. T. (eds.) USDA, Forest Service, Gen. Tech. Report INT-276, Ogden, UT.*
- Young, J. A., P. C. Martinelli, R. E. Eckert, Jr., and R. A. Evans. 1999. Halogeton. Misc. Publ. 1553. Agr. Res. Service, USDA, Washington, D. C.





Cow-Calf Management Guide

Culling the Beef Cattle Herd

*Robert R. Loucks, Lemhi County Extension Educator
University of Idaho*

Cattle are culled or removed from a beef cattle herd for two basic reasons — physical impairment or culling policy. Physical culls in order of volume have normally consisted of cows suffering from cancer eyes, prolapses, poor udders, stifles and other injuries, and poor feet and lump jaws.

Normally less than 1.5 percent of the herd will be culled annually as physical culls. The remainder will be culled because of the culling policy adopted in that herd. Culling policy is the course of action or criteria used within a herd to determine which cattle will be removed.

A University of Idaho study indicates that the average culling rate is about 13.5 percent of the beginning cow inventory (Loucks 1991). In most herds, death loss accounts for an additional 1 to 1.5 percent of the herd. So enough replacement heifers need to be saved to replace about 15 percent of the cow herd annually. High-profit herds retained enough replacements to replace 18 to 22 percent of the cow herd, while low-profit herds retained only enough replacements to replace 11 percent of the cow herd (Loucks 1991).

Culling Policy

Culling policy considers whether cows will be culled for some specific reason such as: terminal age, not raising a calf, being non-pregnant (open), not producing some specified level of calf weight, disposition, or other reason determined by the herd manager. Evaluating various culling policies for biological efficiency is relatively straightforward. Unfortunately, economic evaluation, since it is confounded by the relative prices of cull cows and calves and seasonal price cycles (CL910) and seasonal changes in cow grade, is not quite so simple. It is fair to state, however, that culling policies that maximize biological efficiency rarely maximize economic efficiency.

Open Cows

For spring calving herds, most studies of economic culling policy have concluded that open cows should be culled from the breeding herd at pregnancy check time. The single exception to this general rule is that an open cow less than 7 years old should probably be retained if the price difference between a bred replacement heifer and the salvage value of a cull cow is greater than about \$150.

Whether the cows should be marketed at the time they are culled from the herd or fed and marketed at a later date depends on price and availability of feed, potential slaughter grade changes, and the expected price differentials between the two dates (CL825). In the Idaho study, about 4 to 6 percent of cows on a ranch were culled for being open or breeding late (Loucks 1991).

Pregnant, But Did Not Wean a Calf

Studies are in general agreement that if a cow is sound, under the terminal age desired, and pregnant to calve within the established calving season that economic efficiency is maximized by retaining the cow. The odds of a mature cow losing a second calf are much less than of a heifer losing a calf, and an older cow will usually wean more pounds of calf than a heifer. A cow should not be culled at pregnancy test time for not having weaned a calf.

Open and Dry at End of Calving Season

With the same exception listed under open cows, at typical prices cows without a calf at the end of the calving season should be culled. Since, under normal conditions, 4 to 6 percent of the calves born will die and two-thirds of the calf death loss will be in young cows, aggressive operators will quite often retain a few aged cows over the winter as a source of “graft” calves for young cows that lose calves. The old cows are then culled and marketed immediately after calving.

Terminal Age

Pounds of calf produced per cow peaks at about age 8 and declines thereafter. The rate of decline is primarily a function of feed quality and availability. Most studies are in agreement that the optimum economic culling age is somewhere between 8 and 10 years of age with normal price spreads between cull cows and calves and there is little economic difference within that age range. When calves are high priced in relation to cows, the optimum culling age increases. When calf prices are low, the optimum culling age decreases and cows should be culled at younger ages. Most cows culled on typical ranches are culled because of age.

Production Level

In practice, few cows are culled on the basis of performance or pounds of calf weaned. However, for optimum economic efficiency cows producing the least pounds of calf for their age class should be culled within the constraints of the available number of replacements. Since the biggest cause of low calf production is calving date within the herd, culling late calvers will have almost the same economic effect as culling based on a sophisticated performance evaluation program.

A Practical Program

Obviously, a ranch culling program and replacement program must be coordinated. To achieve economic efficiency, most ranches need to maintain sufficient live-stock to consume the feed produced. For ranches that produce their own replacement heifers, the constraint on culling policy is the number of bred replacement heifers available. Advanced planning is necessary to remove this constraint. Ranches that purchase replacement females have more management flexibility in this regard.

For many Intermountain ranchers, a practical program will consist of culling cows in the following order of priority within the constraints of the number of bred replacement heifers available: (1) physical culls, (2) open cows, (3) open yearling heifers, (4) cows that have reached some terminal age, (5) bred yearling heifers that will calve after the first 45 days of the calving season, and (6) late calvers or young cows that are producing small calves in comparison with other cows in their age group.

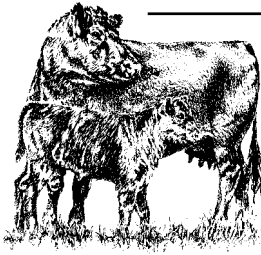
This kind of culling program has the advantage of removing young cattle that will probably not cover operating costs in the next year while they still have high salvage values. Over time, the program focuses on culling late bred heifers and poor producing young cows and eliminates late-calvers by not allowing them to enter the breeding herd.

Many ranchers with intensively managed herds will retain many of the terminal age cows through the calving season as a source of "graft" calves for young cows that lose calves. The aged cows are then marketed after the calving season.

References

- Azzam, S. M., and A. M. Azzam. 1991. A Markovian decision model for beef cattle replacement that considers spring and fall calving. *J. Anim. Sci.* 69:2329.
- Bourdon, R. M., and J. S. Brinks. 1987. Simulated efficiency of range beef production. III. Culling strategies and non-traditional management systems. *J. Anim. Sci.* 65:963.
- Clarke, S. E., C. T. Gaskins, and J. K. Hillers. 1982. Systems analysis of beef production: Effects of culling criteria on net income. *J. Anim. Sci.* 55:489.
- Clarke, S. E., C. T. Gaskins, J. K. Hillers, and W. D. Hohenboken. 1984. Mathematical modeling of alternative selection strategies for beef production. *J. Anim. Sci.* 59:308.
- Greer, R. C., R. W. Whitman, and R. R. Woodward. 1980. Estimation of probability of beef cows being culled and calculation of expected herd life. *J. Anim. Sci.* 51:10.
- Kress, D. D., M. D. MacNeil, and G. E. Dickerson. 1988. Effect of mating system, cow culling policy, and maximum cow age on beef cattle biological and economical efficiency. *Proc. West. Sec. Am. Soc. Anim. Sci.* 39:23.
- Loucks, R. R. 1991. Costs, returns, and profitability on central Idaho cattle ranches in 1989. *Proc. SE Idaho Extension Beef School.*
- Nunez-Dominguez, R., G. E. Dickerson, L. V. Cundiff, K. E. Gregory, and R. M. Koch. 1992. Economic evaluation of heterosis and culling policies for lifetime productivity in Hereford, Angus, Shorthorn, and crossbred cows. *J. Anim. Sci.* 70:2328.
- _____. 1983-91. Analysis of the IRM Survey, University of Idaho IRM Beef Summary Report. Univ. of Idaho, Moscow.
- Tronstad, Russell, and Russel Gum. 1991. Marketing cull cows. *Idaho Farmer-Stockman.* January 1991:21.





Cow-Calf Management Guide

Video Auctions Are Viable Marketing Alternatives for Cattle

*DeeVon Bailey, Extension Economist
Utah State University*

Video cattle auctions have grown rapidly over the past 5 years and appear to offer a viable marketing alternative to buyers and sellers. Superior Livestock Auction (SLA), the nation's largest satellite video cattle auction, offered more than 760,000 head for sale in 1990. Other major video auctions include Satellite Cattle Exchange and Producers Video Auction.

Description of Video Cattle Auctions

Video auction cattle presentations consist of two parts — the video or visual part and the sales catalogue or written description. A flat taping fee per head is usually charged and is included in the sales commission unless the seller rejects the bid, in which case the seller forfeits the taping fee. The taping is usually done by a representative of the video auction company.

Videotapes of about 2 minutes duration are shown while an auctioneer solicits bids. Buyers must register in advance of the sale and undergo a credit check to participate. Buyers may bid either in person or by telephone from any location where a satellite transmission can be received (in the case of satellite video auctions). Cattle are sold F.O.B. the seller's ranch or a nearby scale. This makes transportation costs the responsibility of the buyer, who can adjust bidding accordingly. The video auction representative oversees delivery. Completed sales become cash forward contracts, since all cattle are sold for future delivery.

Relative Costs of Marketing

The cost of marketing cattle can be high. If one accounts for all costs including trucking, shrink, and commissions, the combined costs to the cattle buyer and seller can range from 8 to 10 percent of the value of the

animals. These costs are even higher in areas isolated from the major feeding centers. As a result, an economic incentive exists to reduce these transaction costs.

Compared to traditional regional auctions, video auctions appear to reduce overall trucking costs since the cattle are shipped directly from the seller's location to the buyer's. This suggests buyers may be willing and able to pay slightly higher prices for cattle purchased through video auctions.

Also, competition may be keener for cattle sold at video auctions. More buyers participate in this type of auction than in more traditional regional auctions (Table 1). All registered buyers at video auctions will not be in direct competition, however, because of transportation costs. Other considerations that make video auctions favorable to buyers include a reduction or elimination of commingled lots of cattle, a knowledge of the vaccination history of the cattle, and larger lots that will fit in feedlot pens.

A Comparison of Prices at Video and Traditional Auctions

Research at Utah State University compared prices between regional and video auctions. The research centered on prices received in 1987 for feeder steers weighing 600 to 800 pounds sold at the SLA compared with prices the cattle might have received the same week at three different regional auctions.

The regional markets were Greeley, CO; Dodge City, KS; and Oklahoma City, OK. Only cattle sold at the video auction within the market areas of one or more of the regional auctions were used for price comparisons. A market area was defined as areas within 400 miles of each regional auction. Prices received at the video auc-

tion were adjusted for potential seller trucking costs and shrink to the regional market, different delivery dates, commissions, and possible quality differentials.

If one considers only quoted prices and not transaction costs such as trucking, shrink, and commissions, then regional auction prices were found to be slightly higher than video auction prices for the feeder steers. But if transaction costs are subtracted from bid prices, then the average net prices received at the video auction by sellers were \$0.95/cwt above Oklahoma City, \$3.36/cwt above Greeley, and \$1.48/cwt above Dodge City.

These results are averages over the entire 400-mile market area. The differences would be smaller, or even reversed, for cattle close to the regional markets. On the other hand, the differences would be larger for cattle farther away from the regional center.

This suggests that sellers at the video auction, after adjusting for transaction or selling costs, can keep their cattle at home and receive basically the same price as the Oklahoma City auction, generally considered a high-

price market. While these results are favorable for video auctions, buyers and sellers need to recognize some basic differences between traditional and video auctions.

All cattle are sold for future delivery at video auctions. As a result, video auctions are actually contract rather than cash markets. This implies that buyer and seller compliance with contract specifications are still risks after the sale. Consigning cattle to and buying from reputable auctions that guarantee contract compliance will minimize these risks. But the growth of video auctions suggests that buyers and sellers are willing to accept electronic media as a method to reduce transaction costs.

Buyers and sellers should consider several pricing alternatives when either procuring or selling cattle. Generally, video and other electronic marketing techniques offer buyers and sellers a practical alternative, particularly in isolated areas such as the western United States.

Table 1. Average number of buyers and estimated commissions for regional and SLA auctions, 1987.

| Auction | Day of the week most sales held | Avg. number of buyers viewing auction | Major buyers attending¹ | Sales commissions and other deductions for yearling steers |
|-------------------------|----------------------------------------|----------------------------------------------|-------------------------------------------|-------------------------------------------------------------------|
| SLA ² | Saturday | 225 ³ | 30 | 2% of gross sales + 1.50/head ⁴ |
| OKC ⁵ | Monday | 30 | 15 | \$7.34/head |
| Greeley ⁶ | Tuesday | 50 | 15 | 2% of gross sales + 1.50/head |
| Dodge City ⁷ | Wednesday | 50 | 20 | \$7.20/head |

¹Buyers who frequently buy relatively large numbers of cattle.

²Estimates provided by SLA.

³Average number of registered buyers with SLA. Of this number, 60 to 80 will actually buy cattle at an average sale. During 1988, 1,507 sellers consigned cattle to SLA and 372 different buyers purchased cattle.

⁴The \$1.50 per head is estimated cost of beef board deduction and inspection.

⁵Estimates provided by Oklahoma National Stockyard Company for yearling steers.

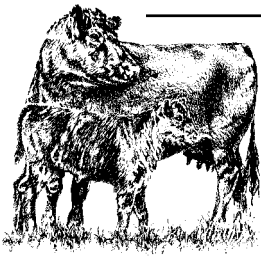
⁶Estimates provided by Greeley Producer Livestock Auction.

⁷Estimates provided by Dodge City Winter Feeder Cattle Auction.



©2001

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, by the Cooperative Extension Systems at the University of Arizona, University of California, Colorado State University, University of Hawaii, University of Idaho, Montana State University, University of Nevada/Reno, New Mexico State University, Oregon State University, Utah State University, Washington State University and University of Wyoming, and the U.S. Department of Agriculture cooperating. The Cooperative Extension System provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws. Second edition; January 2002 Reprint



Cow-Calf Management Guide

Sources of Credit

William W. Riggs, Extension Educator, University of Nevada, Reno
Alan E. Baquet, Extension Farm Management Specialist, Montana State University

Farm and ranch owners and operators can and do borrow money from many different sources. Some lending agencies specialize in certain types of loans and some provide other financial services in addition to lending money.

Lenders of agricultural credit fall into two general categories: institutional and non-institutional. Institutional lenders are Farm Credit System, commercial banks, and Farm Services Agency (FSA). Non-institutional credit sources include dealer financing and individuals. This fact sheet describes each of these types of lenders in more detail.

Farm Credit Systems

Congress in 1916 established the Farm Credit System to provide an additional source of funds for agricultural loans. Changes and additions to the original act have occurred at various times, but the basic structure of the current Farm Credit System became effective with the passage of the Farm Credit Act of 1933.

The Farm Credit System obtains loan funds by selling bonds in the national money markets. Proceeds from these bond sales are made available to district Farm Credit banks in districts plus a central bank for cooperatives. The federal land bank part of the system provides long-term real estate loans through local offices. Short- and intermediate-term loans to farmers, ranchers, and certain other qualified borrowers are also available through the Farm Credit System.

The Farm Credit System is a cooperative wholly owned by its member borrowers with membership coming through the purchase of stock equal to the specified percentage of the amount borrowed. Each member has one vote, and an elected board of directors governs the Farm Credit System.

Commercial Banks

Commercial banks are an important source of agricultural loan funds. Commercial banks are the largest source of non-real estate loans, which are typically short and intermediate-term loans. These are typically for purchasing intermediate assets and annual operating loans.

Banks are not a particularly large source of real estate or long-term loans. This difference is partially explained by the need for banks to maintain liquidity to meet customers' cash requirements and unexpected withdrawals of deposits.

In the past, many banks employed agricultural specialists to work with agricultural credit lines. These individuals were trained in financial management and had a familiarity with production agriculture.

Changes within the industry, however, have been toward area loan centers, with less emphasis on local loan agents. This has had a large impact on rural borrowers who have historically relied on local lending agents. While some banking entities still cater to the agricultural sector through the use of loan officers, most have moved this clientele to officers located in distant loan centers.

The large share of non-real estate loans as held by banks is at least partially explained by the large number of banks and the existence of one in nearly every rural community. This proximity to their customers allows bank personnel to become acquainted with customers and their needs. Most rural banks provide financial services such as checking and saving accounts. Realizing changes in the banking industry has made the past convenience of one stop financial service a discrepancy in most rural communities.

Farm Service Agency (Formally Farmers Home Administration)

In the late 1990s the Farmers Home Administration, an agency of the U.S. Department of Agriculture (USDA), merged with another USDA agency, the Agricultural Stabilization and Conservation Service (ASCS), to form the Farm Service Agency (FSA). This branch of the USDA has county offices in most agricultural counties. This agency is authorized to make farm ownership and operating loans in addition to several other types of loans for rural development purposes. It also has authority to make emergency loans to qualified farmers and ranchers in officially declared disaster areas.

FSA loans are made from funds appropriated by Congress and carry a lower interest rate than loans from other institutions. In addition to making direct loans, FSA is also involved in providing guarantees to other agricultural lenders

To be eligible for FSA farm loans, the borrower must meet minimum program requirements as outlined by the agency. Borrowers should contact their nearest FSA office and request information pertaining to their operation.

Individuals and Others

Individuals, farm supply store dealers, and others are important sources of both real estate and non-real estate loans. For non-real estate loans, the category would include loans from friends, parents, and other relatives, accounts payable at supply stores, and farm equipment and machinery purchases where the dealer finances the purchases through an installment sales contract. Real estate debt owed to individuals and others comes mostly from seller-financed land sales.

Many land sales are made using a land purchase contract in which the seller provides the financing and the buyer makes periodic loan payments directly to the

seller. This form of land sales exchange has become more popular for those retiring out of agriculture that need sustainable income through time. It is also a method for newcomers with some risk to enter into production agriculture.

There are other sources of loans and capital besides those previously discussed. The Commodity Credit Corporation provides some non-real estate loans with stored grain as the collateral. The Small Business Administration can also make some agricultural loans and also has an emergency loan program for farmers in designated disaster areas.

Summary

The discussion in this fact sheet has been on the sources of loans to provide capital for agricultural production; however, the largest source of capital in agriculture is from owner's equity. In other words, farmers and ranchers themselves provide more of the total capital invested in agriculture than all lenders combined.

When establishing and developing credit, it is useful to look at it from the lender's viewpoint. What does a lender consider when making a decision on a loan application? Why can one person borrow more money than another? Why are interest rates and repayment plans different?

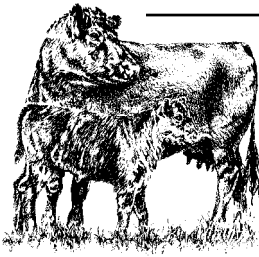
Many factors go into making loan decisions but most can be included in one of the following categories: (1) personal character, (2) management ability, (3) financial position and progress over time, (4) repayment capacity, (5) purpose of the loan, and (6) collateral.

When using these factors as a guide for establishing and developing credit, a prospective borrower should remember that lenders want to make loans. That is their business. However, they are looking for profitable loans that will be repaid.



©2001

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, by the Cooperative Extension Systems at the University of Arizona, University of California, Colorado State University, University of Hawaii, University of Idaho, Montana State University, University of Nevada/Reno, New Mexico State University, Oregon State University, Utah State University, Washington State University and University of Wyoming, and the U.S. Department of Agriculture cooperating. The Cooperative Extension System provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws. Second edition; January 2002 Reprint



Cow-Calf Management Guide

Selecting for Carcass Traits

*DeVon Knutson and Bill Zollinger
Oregon State University*

Within the beef industry, the development of a marketing system based on individual carcass merit rather than on pen average is important for the animal breeder, the feedlot operator, the livestock buyer, and the meat purveyor. A system will be important to the economic success of the total industry.

Most cattle are purchased on some type of grade and yield basis in the major packers in the West. Therefore, a complete understanding of all the factors that affect carcass quality and yield grade is essential to everybody participating in the beef industry.

Currently, several small groups of individuals are sponsoring special programs where premiums are returned to producers based on the quality of the product. The National Beef Quality Audit in 1991 defined targets for several traits for the beef industry, as shown in Table 1.

Generally, carcasses are rewarded for yield grades number 1 and 2 and discounted for those with a yield grade of 4 and 5. Also, carcasses with a quality grade of choice and prime are usually paid more than those grading select.

The spread between choice and select carcasses vary with the season and demand. This spread can be as great as \$12 per hundred during some times of the year and as no difference during other times of the year. Usually there is a \$4 to \$5 spread in favor of those carcasses that grade choice and prime.

Using EPD Values for Carcass Selection

At present carcass EPDs (Expected Progeny Differences) are not readily accessible for most sires. The accuracy for those that are available is not high. EPDs are available for carcass weight, marbling, ribeye area, and fat thickness. Although the data are limited, research trials show a definite advantage for the offspring grading choice from sires with high EPDs for marbling over sires with low EPDs for the same trait. In a study done at the Meat Animal Research Center using the Angus sire summary for 1989 and 1992, Angus bulls with high EPDs for marbling consistently sired a higher percent choice of their calves (Tables 2 and 3).

Table 1. 1991 National Beef Quality Audit carcass targets.

| | |
|-----------------------|-------------------------------------------------|
| Live weight | 1,000 to 1,350 lb |
| Carcass weight | 650 to 850 lb (725 to 750 lb most preferred) |
| Quality grade: | |
| #1 Prime | 7% |
| #2 Choice (upper 2/3) | 24% |
| #3 Choice (lower 1/3) | 40% |
| #4 Select | 29% |
| #5 Standard | 0% |
| Yield grade | 1's and 2's |
| Fat thickness | .20 to .40 inches |
| Ribeye area | 11.0 to 15.0 square inches |

Source: 1991 National Beef Quality Audit.

Table 2. Average Expected Progeny Differences (EPDs) for sire group.

| Sire summary year* | Sire group | Number of bulls | Expected Progeny Difference | | | |
|--------------------|------------|-----------------|-----------------------------|------------|-------------|----------|
| | | | Birth wt | Weaning wt | Yearling wt | Marbling |
| 1989 | High | 6 | +5.2 | +21.5 | +41.1 | +59 |
| | Low | 6 | +6.1 | +27.0 | +51.6 | -.23 |
| 1992 | High | 6 | +4.1 | +25.2 | +41.5 | +31 |
| | Low | 6 | +5.2 | +29.4 | +52.0 | -.18 |

*Taken from annual Angus Sire Summary.

Table 3. Production traits of steers and heifers sired by low or high marbling Expected Progeny Difference (EPD) sires.

| Sire marbling EPD: | Steers ¹ | | Heifers | |
|----------------------------------------|---------------------|-------|---------|-------|
| | Low | High | Low | High |
| Number of animals | 63 | 66 | 65 | 59 |
| Suckling | | | | |
| Birth wt, lb ² | 93 | 93 | 86 | 87 |
| Calving difficulty ³ | 1.5 | 1.4 | 1.3 | 1.5 |
| Adjusted 205-day wt, lb ^{2,4} | 540 | 524 | 515 | 492 |
| Actual weaning wt, lb ^{2,4} | 529 | 503 | 506 | 472 |
| Finishing | | | | |
| Initial wt, lb ^{2,4} | 639 | 612 | 737 | 705 |
| Final wt, lb | 1,101 | 1,093 | 1,106 | 1,064 |
| Daily gain, lb | 2.93 | 3.05 | 3.14 | 3.05 |
| Feed intake, lb/day ² | 19.0 | 19.4 | 24.3 | 22.9 |
| Feed/gain ^{2,5} | 6.47 | 6.36 | 7.75 | 7.47 |
| Carcass | | | | |
| % choice | 47 | 77 | 47 | 72 |
| Yield grade | 2.82 | 2.90 | 2.52 | 2.47 |
| % yield grade 1 | 4.7 | 4.5 | 16.9 | 16.9 |
| % yield grade 2 | 60.3 | 57.6 | 72.3 | 62.8 |
| % yield grade 3 | 28.7 | 31.8 | 9.3 | 18.6 |
| % yield grade 4 | 6.3 | 6.1 | 1.5 | 1.7 |

¹Sex * marbling for all measurements (P>.1), thus data were pooled.

²Sex effect (P<.01).

³1=no assistance, 2=minor difficulty, 3=mechanical assistance, 4=caesarean section, 5=abnormal presentation.

⁴Marbling effect (P<.01).

⁵Feed/gain was analyzed as gain/feed. Reported feed/gain is the reciprocal of gain/feed.

As shown in Fig. 1, less external fat was found in the high marbling EPD sire group. Intermuscular fat percentage or seam fat was not affected by marbling EPD groups. These results indicate that it is possible, using existing genetic resources, to maintain marbling score and intramuscular fat percentage while decreasing fat deposition in other parts of the carcass. EPDs are another tool to use when selecting for carcass merit.

Selection for reduced fat thickness may be associated with increases in mature weight, age at puberty, and reduced fertility. Cattle need to maintain a body condition score of 5 or 6 to maintain reproductive effi-

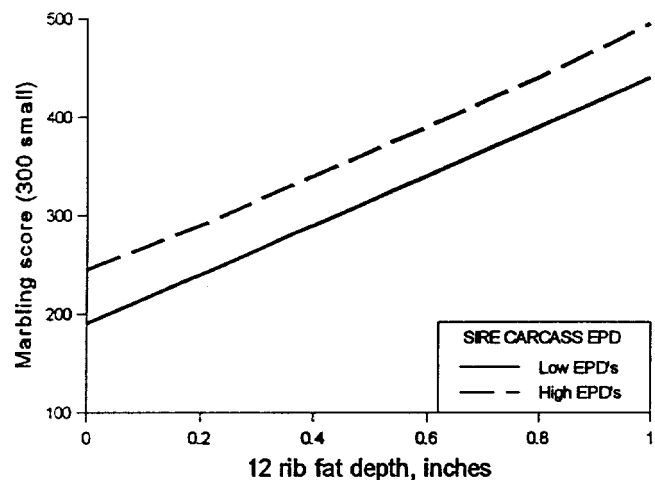


Fig. 1. Regression analysis for steer marbling score and 12th rib fat depth.

ciency. Lean body composition and larger mature size will increase nutritional requirements and decrease cow efficiency. To compensate for this change ranch management needs to supply additional feed or carry fewer cows.

Carcass Data Collection

Heritabilities are moderate to high for carcass traits (Table 4). Collecting and using carcass data is an excellent way to make herd improvements. Pasture mating or artificial insemination with individual sires allows identification of sires that produce desirable carcasses. In programs of multi-sire breeding, carcass data evaluations apply to the whole herd and are more difficult to effect change.

Carcass data can be collected several different ways. The National Cattlemen's Beef Association (NCBA) has a carcass collection program arranged with several packing plants where either individual or group carcass data can be collected. USDA tags can be used to collect carcass information. Some custom feedlots will also offer carcass data collection as a service. Most packing plants provide a detailed report on quality and yield grades of kill lots. Regardless of the collection method, it is the producer's responsibility to make sure well in advance that the packing plant and the feeder understand that carcass data will be collected on a particular set of cattle.

Table 4. Heritability estimates for carcass traits.*

| Trait(s) | Heritability |
|--------------------------------------|--------------|
| Carcass weight | .50 |
| Quality grade | .40 |
| Marbling | .35 |
| Fat depth | .45 |
| Ribeye area | .40 |
| Yield grade | .30 |
| % retail cuts (% cutability) | .30 |
| Retail product weight | .40 |
| Estimated retail cuts per day of age | .30 |
| Fat trim wt. | .50 |
| Frame | .45 |
| Muscling | .45 |
| Tenderness | .50 |

*Source: Based on numerous research studies.

Summary

As individual carcass data become more important to the profits or losses of the producer, it will become more important to collect carcass data. As more carcass data are collected, EPDs for carcass data will be-

come more available to bull buyers. Greater improvements can then be made in the industry for carcass quality grade and yield grade.

Carcass data are now available to the producer through various programs. Other economic traits such as reproductive performance cannot be ignored while emphasis is placed on carcass traits.

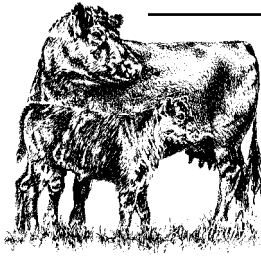
References

- Andries, K. M., R. R. Schalles, M. E. Dikeman, and D. E. Franke. 1995. Breed and management comparisons and genetic parameters for carcass traits. *Kansas State Univ. Cattlemen's Day*. p. 102-104.
- Barreras, A., N. Torreniera, C. Pinedo, and R. D. Sainz. Influence of genetic composite and sex on carcass traits in beef cattle slaughtered in Baja, California. *Proceedings, Western Section, American Soc. of An. Sci.*
- Gwartney, B., C. Calkins, R. Rasby, R. Stock, B. Vieselmeyer, and J. Gosey. 1994. Using Expected Progeny Differences to produce marbled, lean beef: carcass yield and palatability traits. *Nebraska Beef Report*. p 57-59.
- Vieselmeyer, B., R. Rasby, B. Gwartney, C. Calkins, R. Stock, J. Gosey, and M. Dragastin. 1994. Using Expected Progeny Differences to produce marbled, lean beef: production traits. *Nebraska Beef Report*. p. 54-56.



©2001

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, by the Cooperative Extension Systems at the University of Arizona, University of California, Colorado State University, University of Hawaii, University of Idaho, Montana State University, University of Nevada/Reno, New Mexico State University, Oregon State University, Utah State University, Washington State University and University of Wyoming, and the U.S. Department of Agriculture cooperating. The Cooperative Extension System provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws. Second edition; January 2002 Reprint



Cow-Calf Management Guide

Weather Related Sale of Livestock and the Tax Implications

*C. Wilson Gray, District Extension Economist
University of Idaho*

Occasionally, due to weather related events (drought, flooding, other), stockmen may be forced to sell more offspring or breeding stock than planned. The Internal Revenue Service (IRS) allows this to be treated as an involuntary conversion if four rules are met. The rules only apply to animals sold in addition to the normal course of business. The income from these animals may be deferred to the next year if:

1. Your principal business is farming/ranching.
2. You use the cash method of accounting.
3. You can show that under normal circumstances the sale would not have occurred this year except for the weather-related conditions.
4. The weather-related condition has resulted in your area being designated as eligible for assistance by the federal government.

Sales made before the area became eligible for federal assistance still qualify as long as the weather event that caused the sale also caused the area to be designated as eligible for federal assistance. The designation can be made by the President, the USDA or any of its agencies, or other federal agencies.

Usual Business Practice

You will need to determine the number of animals you would have sold under normal conditions following usual business practices. Only the income or gain from selling animals **over and above** what would have occurred in a normal year is allowed.

If you are faced with weather-related sales in more than one year, a separate election must be made for each year. If you make this choice in successive years, there are special rules that prevent your choice in the first year from adversely affecting your choice in the second year.

- Do not include the amount deferred from one year to the next with the sale or exchange of livestock in the later year when figuring the amount to be postponed.
- In determining your normal business practice for the later year, exclude any earlier year for which you make this choice.

In order to make the election to postpone reporting income from weather-related sales of livestock, you must attach a statement to your tax return for the year of the sale. The statement must include your name, address, and Social Security number and the following information about each class of animals sold:

1. A statement that you are making an election under section 451e.
2. Evidence of conditions that forced the early sale and the date, if known, that the area was designated eligible for federal disaster relief.
3. An explanation of the area affected by weather-related conditions leading to your early livestock sale.
4. The number of livestock sold in the three preceding years.
5. The number you would have sold in this tax year had you followed normal business practices.
6. The total number sold and the number sold because of weather-related conditions.
7. A computation of the income to be postponed for each class of livestock.

The statement and return must be filed by the due date of the return, including extensions. If you filed your return on time for the year without making the choice, you can file an amended return within 6 months of the due date (excluding extensions). Attach the statement to the return and write "Filed pursuant to section 301.9100-2" at the top of the statement.

Connection with Affected Area

The livestock do not have to be raised or sold in a weather-related area to qualify for the postponement. The livestock producer qualifies for postponement if the sale occurred solely because of weather-related conditions that affected the water, grazing, or other requirements of the livestock so that the sale became necessary.

The election and the amount calculated to be postponed must be made separately for each generic class of animals such as hogs, sheep, or cattle. The amount to be postponed for each class can be calculated as follows:

- Divide the total income realized from the sale of all livestock in the class during the tax year by the total number sold, and
- Multiply the result by the excess number of animals sold because of the weather-related conditions.

Example

As a calendar year taxpayer, you normally sell 105 head of calves and 15 cull cows during the year. Because of a drought, you sell 135 calves and 25 cows during the year. You receive \$63,110 from the sale of calves and \$10,500 from the sale of cows. Because the government declares the area eligible for drought assistance, the income you may elect to postpone until next year is:

Calves: \$14,024 $(63,110 \div 135 \times 30)$

Cows: \$4,200 $(10,500 \div 25 \times 10)$

A total of \$18,224 may be postponed one year.

Replacement Stock and Reporting a Gain from Involuntary Conversion

If solely because of weather related conditions (e.g., drought or flood) you sell or exchange livestock held for draft, breeding, or dairy purposes you may treat the sale as an involuntary conversion. Only livestock sold in excess of the number you normally would sell under normal business practices are considered involuntary

conversions. The rules for ordinary gain or loss (Ch. 10, Farmers Tax Guide) apply unless the livestock is later replaced. Gains and losses from breeding livestock sales are reported on Form 4797.

You postpone gain by reporting your choice on your tax return for the year in which you receive the gain (insurance proceeds, sale of stock, other). The statement should include:

- The date and details of the involuntary conversion,
- The reimbursement received,
- How you figured the gain.

Taxpayers have up to 2 years from the time of forced sale to replace stock sold due to a weather-related condition. The replacement period begins on the date the livestock were sold, exchanged, or damaged or destroyed. The period ends 2 years after the close of the first tax year in which you realize any part of the gain from involuntary conversion.

Replacement property must be purchased with the specific purpose of replacing your property. The replacement property must be similar or related in service or use to the property it replaces. Property acquired as a gift or inheritance does not qualify as replacement property.

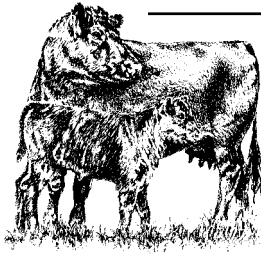
Special rules may also apply if buying replacement property from a relative. In the year replacements are purchased for livestock sold due to weather-related conditions the tax return should have a statement with information on:

1. The date replacement livestock was purchased.
2. The cost of replacement livestock.
3. The number and kind of replacement livestock.

If the purchase cost of replacements is less than the receipts from the sale of the livestock due to weather-related conditions the excess is a taxable gain and must be reported as income.

A general explanation of weather-related sale procedures is in the Farmers Tax Guide (IRS Pub. 225) in chapters 4 and 13. It is always advisable to consult with a reliable accountant and federal agency representatives.





Recreational Enterprises Can Complement Beef Production

*Thomas E. Bedell, Extension Rangeland Resources Specialist
Oregon State University*

Providing opportunities for non-ranch people to enjoy a piece of your way of life generally is not within the objectives of most ranchers. Many, perhaps most, ranchers and their families would rather not even think about recreation as a business form of income. However, leisure time and opportunity still are on the increase and this means the demand for high-quality recreation will be satisfied by someone. Perhaps it is time to consider advantages and disadvantages to ranch-based recreation.

Outdoor recreational opportunities are highly sought after. In the West, this has occurred traditionally on public land, but private land now is recognized as having important attributes. Private lands, or ranches if you will, have not only better soils and more diverse vegetation but often better accessibility and more desirable water regimes and scenery than public lands. Big game may spend a significant part of their time on private lands. If game animals are on your property during hunting season, charging people access to your property to hunt might well make up for the amount of forage they consume. Given these general facts and trends in people's demands, should you be looking at providing recreational opportunities on a profit basis?

Forms of Recreation

Obviously, each ranch is different so only general statements can be made. Proximity to public land need not be a disadvantage although many people do recreate on public land. With rare exceptions, however, public land recreation is dispersed and undeveloped with few services offered or available. Generally, being close to public land will be an advantage as long as private land provides sufficient complementarity.

The list of recreational opportunities for your ranch could be rather lengthy. Often, we are limited only by our ingenuity and creativity. A partial list, all for a fee or charge, could include hunting for big game, small game, upland birds or waterfowl; angling (streams, lakes, or

reservoirs); all forms of ranch stays or bed and breakfast which do not have to be activity-centered or oriented; camping of all sorts including RV's; horseback riding, both trail rides and cross country; participating in actual ranch work; hiking or backpacking; all forms of water, snow, or ice-based sports, or straight-forward loafing. If you value your rural way of life, you can bet others will also. Why not consider marketing it? All ranches have unique scenery and an abundance of solitude. Both are "commodities" in demand.

Characteristics of Recreation Enterprises

By definition, recreation enterprises are people-based. This may be perceived by many ranchers as something they would rather not deal with. The numbers of people depend on just what services and opportunities may be offered, however. Example: a fee hunting set-up where you deal with a management consultant, or an agent for a group of hunters. If you are concerned about the people management part, there are ways that can be addressed. At the conclusion of this fact sheet are listed several references that will help you assess some of the concerns you may have.

One strong attribute of a recreation enterprise is that you are the master of market prices, schedules, services, etc. You are not dependent on someone else to control your market price. And, with rare exceptions, you will be offering unique services and experiences. By recognizing that people are creatures of habit, you can cultivate repeat clientele. Generally the market for such services is nowhere near being saturated. In other words, you will have a relatively scarce resource in relation to the demand for it.

Recreation Enterprise Considerations

The basic similarity among all private land recreational enterprises is the fact that fees are received for a service provided to a client. This is true whether the service is access to your property in order to hunt or for something like camping or horseback riding.

Game animals are the property of the state and even though you provide their habitat, you do not own them. Title to that public property passes to a private citizen only after it is bagged. What you can market is access to the opportunity to bag a game animal and any attendant services you may wish to provide, such as guiding, food, housing, transportation, and the like. You must adhere to the laws, policies, and regulations of your state. Because each state has its own policies, familiarity with them is mandatory. You need to be aware that a surprising amount of opposition to fee access hunting may exist from organized hunter groups and local wildlife department personnel. You can be most effective by developing a positive and persistent education program.

Because the recreation business concerns inviting people onto your premises as invited guests, you need to understand the legal liability you may incur and to make certain your insurance coverage is adequate. Do not shortcut these necessities. Only people closely familiar with law and insurance can give you clear guidance, although some general information is contained in the references.

In the West, the business of charging access for hunting is on the increase. Often some modification of a range management program is needed to enhance the habitat for game, especially during hunting season. Conversely, situations do exist where the game already are in abundance under the current kinds of management. Costs incurred in this form of operation could be quite minimal. A multi-year management plan should be developed with a high degree of involvement by people knowledgeable in wildlife management and behavior. You should be prepared to be flexible and offer multi-tiered opportunities (i.e., lowered or no fees for hunting females, which could be in excess of resource capability within a short time period).

The size, location, and configuration of your property could be a limitation to services offered. Cooperative agreements with adjacent owners could well be the key to success. Several kinds of business arrangements can be considered. Don't feel you are confined to individual entrepreneurship if you do not want to be.

Marketing recreation opportunities obviously is greatly different from selling cattle. But once an enterprise is launched, clientele must be attracted to you. Depending upon the enterprise and its uniqueness, repeat business and word of mouth can almost be counted on. Nevertheless, some advertising will be necessary. Some of the references address specific facets of marketing.

Sources of Assistance

Currently, relatively few people offer commercial recreational opportunities on ranches. For this reason, people

in the business probably will not be reluctant to share their knowledge and experience when asked. If or when more ranchers are in this business, the situation could be different.

The Cooperative Extension System should be a primary source of information. If the services you offer include fish or wildlife, you may need to contact state fish and wildlife agency personnel. They can help you with habitat management plans and census, and can actually be a strong proponent under the right conditions. If county/state land use plans are in effect, you should be in conformity. This is true also regarding rural property tax criteria. Public health regulations should be consulted under certain circumstances. Management consultants should not be overlooked if they can be located and their expertise verified.

References

- McClelland, S. D., D. A. Cleaves, T. E. Bedell, and W. A. Mukatis. 1989. Managing a fee-recreation enterprise on private lands. Oregon State Univ. Ext. Circ. 1277. Available for \$1.25 from Agricultural Communications, Oregon State Univ., Corvallis, OR 97331.
- Bedell, T. E., and R. Rasker. 1987. Proceedings of the 1987 Pacific Northwest Range Management Short Course, Developing profitable resource based recreation on private lands. Oregon State University Extension Service. Contains 28 presentations on business, social, wildlife habitat, and other management aspects of fee-hunting and other fee-recreation enterprises. Available for \$8 from Dept. of Rangeland Resources, Oregon State Univ., Corvallis, OR 97331.
- Grafton, W. N., A. Ferrise, D. K. Smith, and J. E. Miller (eds). 1989. Conference Proceedings: Income opportunities for the private landowner through management of natural resources and recreational access. R. D. No. 740. West Virginia Univ. Ext. Ser., Morgantown. Available from Anthony Ferrise, 2104 Agricultural Sciences Bldg., West Virginia Univ., Morgantown, WV 26506-6108.
- Pineo, D. 1985. Wildlife and recreation management on private lands: A guide for Washington. Contains 11 chapters on biological, business, and social management for fee-based hunting and fishing in Washington. Available for \$10 from Washington Forest Protection Assn., 711 Capital Way, Suite 608, Olympia, WA 98501.
- Rollins, D., ed. 1988. Symposia proceedings, recreation on rangelands: Promise, problems, projections. Society for Range Management. Contains seven excellent presentations on various aspects of fee-based recreation on private land. Available for \$10 from Dept. of Range and Wildlife Management, Texas Tech Univ., Lubbock, TX 79409.
- White, R. J. 1986. Big game ranching in the U.S. Wild Sheep and Goat International. Comprehensive treatise; contains 15 chapters on various aspects of managing domestic and exotic species. Available for \$29.95 plus \$2.00 shipping from WSGI, Box 244, Mesilla, NM 88046.



IMPORTANT!

Subscription Registration Form

Cow-Calf Management Guide

Cattle Producer's Library

The materials in the *Cow-Calf Management Guide & Cattle Producer's Library* were prepared by a committee of extension animal scientists in Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The manual is a joint publication of the Cooperative Extension System in these states.

Copies may be ordered from the University of Idaho, Agricultural Publications, PO Box 442240, Moscow, ID 83844-2240 (phone 208/885-7982, fax 208/885-4648). Cost is \$95.00* plus postage (\$3.50 to \$5.00 depending on distance from Moscow, Idaho).

Registered subscribers will receive, for no extra charge, the annual fall update and a CD-ROM in 2002, 2003, and 2004. This version includes all previous updates. **You must register your handbook to receive updates.**

*Idaho residents add 5 percent sales tax and \$3.50 postage for a total price of \$99.75 (\$103.25 with postage).

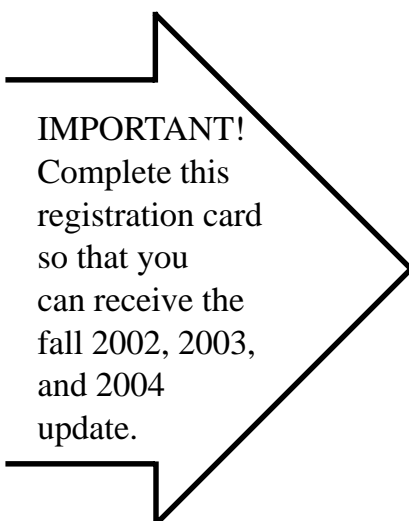
Three important reminders to all who read these materials:

Basic Information—Although this handbook is written by western states specialists, most of the information is useful to all cattle producers regardless of location.

Trade names—To simplify information presented, trade names are used occasionally throughout the handbook. Use of trade names does not imply an endorsement of the product nor criticism of similar products that are not mentioned.

Chemical and drug recommendations—Recommendations made in *Cattle Producer's Library* were based on the best information available at the time of writing. Beef specialists annually review the handbook.

This is a rapidly changing industry. Before using pesticides or animal health products, read the instructions on the label. Be sure the label specifies that the product can be used with the class of livestock and for the problem you have identified. Read and follow all precautions and restrictions on each label.



Agricultural Communications
University of Idaho
PO Box 442332
Moscow, ID 83844-2332

04

Register me as an owner of the Second Edition of the (write legibly)

Cow-Calf Management Guide
Cattle Producer's Library

Name _____

Address _____

(Route, P.O. Box, or Street)

(City)

(State)

(Zip Code+4)

Second Edition

Cow-Calf Management Guide

Cattle Producer's Library

Prepared by the Western Beef Resource Committee, which consists of beef specialists, economists, range scientists, animal nutritionists, county educators, and veterinarians from the Cooperative Extension System and from cattle industry representatives. The WBRC meets annually to review contents. WBRC represents the following universities:

University of Arizona
University of California
Colorado State University
University of Hawaii
University of Idaho
Montana State University
University of Nevada
New Mexico State University
Oregon State University
Utah State University
Washington State University
University of Wyoming

Coordinating Editor: Jerald R. Adams, University of Idaho (call: 208/885-7235, email: jadams@uidaho.edu)

CD-ROM Design and Production: Kit Craine, Ag Communications, University of Idaho

Production: Ag Communications, University of Idaho

Subscriptions: University of Idaho, Kristin Johnson, Ag Communications, PO Box 442332, Moscow, ID 83844-2332 (call: 208/885-6436, fax: 208/885-9046, email: agcomm@uidaho.edu)

Distribution: University of Idaho, Ag Publications, PO Box 442240, Moscow, ID 83844-2240 (call: 208/885-7982, fax: 208/885-4648, email: agpubs@uidaho.edu)

Cost: \$95.00** plus postage*** (includes subscription for annual fall updates through 2004)

*All previous updates are included. By registering you will receive the 2002, 2003, and 2004 updates.

**Idaho residents add 5 percent sales tax (and \$3.50 postage) for a total price of \$99.75 (\$103.25 with postage).

***Idaho, Oregon, and Washington postage = \$3.50, other western states = \$4.00, midwestern states = \$4.50, all other locations \$5.00.

©2001 University of Idaho Extension

