

Approved: Eugene L. Shore 2-4-93  
Date

MINUTES OF THE HOUSE COMMITTEE ON AGRICULTURE.

The meeting was called to order by Chairperson Eugene Shore at 9:05 a.m. on January 27, 1993 in Room 423-S of the Capitol.

All members were present except: Representative Swall - Excused

Committee staff present: Raney Gilliland, Legislative Research Department  
Jill Wolters, Revisor of Statutes  
Kay Johnson, Committee Secretary

Conferees appearing before the committee: Sam Withiam, President, North American Elk Breeders Association  
Gary Hathaway, Ulysses, KS  
Lynn Kaufman, Moundridge, KS  
Dr. R. Daniel Walker, Kansas Animal Health Commissioner  
Mike Beam, Kansas Livestock Association  
Larry Woodson, Director, Division of Inspections  
Darrell Monte, Kansas Department of Wildlife and Parks

Chairman Shore called the meeting to order and opened hearings on **HB 2106: Regulating the production of domesticated deer**. Chairman Shore called upon Gail Bartel, a farmer and deer and elk rancher from Butler County. Mrs. Bartel stated she supports **HB 2106** because deer and elk are very hardy and adapt well to Kansas' climate, are cheaper to feed than cattle and bring a better price at market. It is a viable alternative to other domestic meat products.

Sam Withiam, President, North American Elk Breeders Association (NAEBA), testified in favor of **HB 2106, attachments #1-6**. He emphasized that deer and elk farming is not a new concept and is easily adapted to the Kansas climate. It is very much like any other breed industry, but deer and elk are hardy and more efficient than cows and the very land that you can't farm is the land deer and elk enjoy most.

Gary Hathaway, a Ulysses, Kansas elk rancher, testified in favor of **HB 2106, attachment #7**. He stated the attraction to raising elk is the ability to utilize some less productive land, for example, CRP grass, native pasture and the corners of a center pivot sprinkler system. Once the animals are fenced in and domesticated and there is no intention to put them back in the wild, the State Board of Agriculture is a more appropriate governing agency than the Department of Wildlife and Parks. Responding the Chairman Shore's request, Mr. Hathaway described the higher fencing requirements for deer and elk.

Representative Rutledge asked about cross breeding. Mr. Withiam responded that it probably would happen, just as you seldom see a purebred herford in a feedlot anymore.

Referring to the problem of eradicating disease in domesticated hogs that have been in contact with wild hogs, Representative Lloyd asked if there is a similar problem in deer and elk farming. Mr. Hathaway responded that there is a possibility, but through association with various animal health agencies they hope for it not to happen.

Lynn Kaufman, Moundridge, KS, testified in support of **HB 2106, attachment #8**. Mr. Kaufman raises Rocky Mountain Elk and Fallow Deer to produce venison products such as steaks, chops, jerky and summer sausage. All of his products are federally inspected.

Representative Bryant asked about confinement parameters. Mr. Kaufman said that normally it is four

## CONTINUATION SHEET

MINUTES OF THE HOUSE COMMITTEE ON AGRICULTURE, Room 423-S Statehouse, at 9:05 a.m. on January 27, 1993.

deer per acre and one elk per acre and one-half.

Responding to Representative Lloyd's question on supplemental feeding, Mr. Kaufman said he used supplemental feed year-round. The total intake for a deer is about five pounds per day.

Representative Mc Clure asked how many deer and elk farmers are in Kansas. Mr. Kaufman said there are ten or so.

Chairman Shore asked about disease problems. Mr. Kaufman said he vaccinated the first year and has done nothing since but yearly worm treatments and has had no problems.

Dr. R. Daniel Walker, Kansas Animal Health Commissioner, testified in support of **HB 2106**, attachment #9.

Dr. Walker requested the bill be refined to give the Animal Health Department more directive. Currently, a health certificate must be on file, but he has prepared drafts to require TB tests and any change of ownership would require testing. Responding to Representative Rutledge's question about transmitted diseases, Dr. Walker said these are manageable risks, but need to be addressed.

Mike Beam, Kansas Livestock Association, testified in support of the intent to give the Animal Health Department regulatory authority of domestic deer and encouraged the committee to include regulatory language for exotic animals also, attachment #10.

Larry Woodson, Director, Division of Inspections, Kansas State Board of Agriculture appeared before the committee to explain the ramifications of **HB 2106** under the Kansas Meat and Poultry Inspection Act, attachment #11. The Federal Wholesome Meat Act of 1967 provides 50:50 funding for inspections. Deer and elk are not covered and are currently slaughtered without federal matching funds. Kansas could either establish voluntary inspections of deer and elk (and receive matching funds) or continue the existing program (with no matching funds).

Darrell Montei, Kansas Department of Wildlife and Parks, expressed some reservations concerning **HB 2106**. The Department of Wildlife and Parks would prefer to maintain the permit program for deer and elk until an overall plan is prepared to address the entire big game ranching issue. He also suggested language changes to the bill as outlined in attachment #12.

The meeting adjourned at 10:00am. The next meeting is scheduled for January 28, 1993.

# NORTH AMERICAN ELK BREEDERS ASSOCIATION

January 25, 1993

## TO THE MEMBERS OF THE KANSAS STATE LEGISLATURE:

The farming of cervidae (deer and elk) although unfamiliar to some, is not a new concept. New Zealand alone sold over \$110,000,000 dollars in venison products in 1991. Many European countries have been engaged in the agriculture pursuit of venison raising for many years. History tells us that game farming is as old as farming itself. In ancient times the nobility in most European countries had private game ranches. The Romans were active game farmers throughout their history and wrote manuals on deer restraint, the best materials to use to enclose deer, supplementary feeding and general management of their herds. Several references to the raising of deer are cited in the Bible (Deuteronomy 14 and I Kings 4) and Marco Polo wrote of great herds of deer kept by the Kublia Khan (circa 1259 - 1294 A.D.) Deer farming has been practiced in China since 200 B.C.

With the emergence of domesticated elk farming as a viable agricultural enterprise in the United States, the North American Elk Breeders Association (NAEBA) was formed in 1990 by a group of 32 elk breeders in the United States. With the phenomenal growth of the elk industry NAEBA now has over 700 members - all this in less than 3 years! NAEBA's membership stretches from Hawaii and Alaska to Florida and South Texas.

The good health and welfare of our elk is the primary purpose of our association. NAEBA has worked with many State and Federal regulatory agencies to determine any health problems that might be associated with game farming and establish uniform testing protocols for cervidae. NAEBA is proud to announce that, working through the United States Animal Health Association with Allied Industry Status, a Uniform Methods and Rules for Bovine Tuberculosis Eradication in Cervidae has been approved which has been submitted to the USDA for formal implementation.

NAEBA has developed a close working alliance with the U.S. Cattlemen's Association, the U.S. Dairymen's Association and the U.S. Farm Bureau in addressing the issues of animal health. NAEBA jointly authored a resolution with the U.S. Cattlemen's Association to impose health restrictions on the TB infected cattle coming into the U.S. from Mexico which was passed by the U.S. Animal Health Association at its annual meeting in San Diego last year.

Elk farming is already of substantial economic significance to the State of Kansas. Many of our members are from Kansas and they have contributed many positive things to the

HOUSE AGRICULTURE  
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# NORTH AMERICAN ELK BREEDERS ASSOCIATION

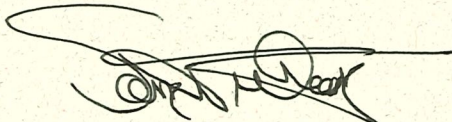
PAGE TWO  
MEMBERS OF KANSAS STATE LEGISLATURE  
JANUARY 25, 1993

industry. NAEBA has received inquiries from many prospective elk breeders in Kansas. By placing domestic elk raising under the regulation of the Kansas Department of Agriculture you will make Kansas a much more desirable state in which to raise elk which would result in substantial dollars invested in land, improvements and animals - this will directly effect the Kansas economy by a transfusion of economic benefits. At a time when our rural economies have been under siege and the traditional life style associated with ranching is endangered it is a pleasant experience to engage in an agricultural activity that is both environmentally wholesome and profitable.

Elk farming/ranching is easily adapted to the Kansas climate and agricultural practices. Elk raising has great potential for increasing productivity on tracts of marginal land that are not otherwise suited for traditional farming methods. Many farmers have fenced off parts of their farms that they would not normally be able to cultivate and are not producing any income and use that land to raise elk. Elk raising gives these farmers a generous additional income source in conjunction to their traditional crops and requires very little additional effort on their part. Pastures require little renovation or alteration of land surface before utilization and most cover can be left since elk make good use of it for shelter and food. Elk raising conserves the soil by leaving it in grass rather than tilling it each year and exposing it to erosion by wind or water.

Elk far outperform cattle in both efficiency of feed conversion and income for the producer. Elk eat only 1/3 as much as cattle and are worth more than three times as much per head. Feed requirements to produce 1 lb. of beef will produce 1.6 lbs. of venison. Elk venison not only tastes terrific but is listed by the USDA as the very lowest in fat and cholesterol. As domestic consumers become more health conscious and as the international demand for venison products continues to grow, elk ranching becomes the brightest spot in the search for alternative sources of revenue in agriculture.

Yours truly,



Sam Withiam  
President,  
North American Elk Breeders Association

## BACKGROUND

Elk are widely known for their majestic beauty and regal stature. Elk have freely roamed vast portions of North America for over 40,000 years. What most people do not realize is that elk are being raised domestically on farms and ranches in almost every state in the U.S.

Game farming is not a new concept. While game farming is relatively new in North America, it is as old as farming itself in most European countries. In ancient times the nobility in most European societies had private game ranches. The Romans were active game ranchers throughout their history and several references are made to game ranching in the Bible. Marco Polo wrote of great herds of deer kept by the Kublai Khan and deer farming has been practiced in China since 2000 B.C.

New Zealand is the current world leader in venison, velvet and deer product sales. Their 1990 export revenue from deer products exceeded \$101.9 million dollars.

It is a well known fact that venison is the preferred meat of most Europeans and it is quickly gaining acceptance in the U.S. as a healthy alternative to other red meats.

Game ranching has been practiced in North America since before the turn of the century. With the current interest in low-fat and low cholesterol meats combined with the need for alternative sources of revenue in agriculture, game farming and ranching is beginning to pay a much larger role to producers as they experience the benefits of this newly emerging industry in the U.S.

## **SOUTH CENTRAL ELK BREEDERS ASSOCIATION**

SCEBA is a chapter of the North American Elk Breeders Association. SCEBA membership is comprised of persons residing in Texas, Oklahoma and Louisiana. SCEBA is a regional organization aimed at addressing issues effecting local producers and assisting the breeders in this region with marketing, education and governmental regulation policies.

## **THE NORTH AMERICAN ELK BREEDERS ASSOCIATION**

NAEBA is a non-profit association founded to promote the elk ranching industry by educating its members and the general public in proper management and breeding practices for elk. It is the philosophy of this association to share the fantastic rewards its members have experienced with diversification from traditional agriculture operations through elk ranching.

NAEBA was formed two years ago and has already grown to over 700 members, the association has become the voice of the elk industry and serves its members in many ways including: maintenance of a pure-bred elk registry, providing quarterly full-color magazine journal of the industry, publishing newsletters and keeping members informed as to governmental decisions and health issues that will effect them, providing assistance in marketing, producing association sponsored satellite sales, and much more.

**NAEBA  
7301 NW Tiffany Springs Road  
Kansas City, MO 64153  
(816) 746-5700**

## GETTING STARTED

Before starting an elk farm it is a good idea to visit an existing one to view the animals and discuss any questions you may have with an actual producer. SCEBA members have a great deal of practical experience they will share which is invaluable to people just starting out in the business. Attend the seminars, workshops and Conventions sponsored by NAEBA and SCEBA to learn more about the industry, ask questions and talk to people who are working hands on with elk in your area. NAEBA publishes timely articles covering all aspects of raising elk in its quarterly Journal and has video tapes available for purchase on numerous topics such as handling facilities, velveting, health issues, etc.

Elk do not require barn type housing but must have a higher containment fence than cattle. You will need a source of water, shade and cover, pasture land, a handling facility with containment chute, a basic herd of breeding stock, some basic knowledge and experience in handling livestock in addition to State license requirements (call your State Department of Wildlife for a license application). Elk handle much like cattle and can be much more enjoyable, rewarding and profitable.

Breeding stock is available from many members of SCEBA. It may be a good idea to look at the availability of stock and get the opinion of experienced breeders prior to making a large investment. It is generally easier to buy animals from breeders in your geographic region than dealing with requirements involved in importing animals from outside your state. Animals purchased in your region are already adapted to environmental conditions and will not have to take additional time adapting to climate, diet, etc. Elk can be susceptible to stress due to excessive shipping and handling and this should be kept to a minimum.

# **ELK FARMING AND RANCHING in TEXAS OKLAHOMA and LOUISIANA**



## **SOUTH CENTRAL ELK BREEDERS ASSOCIATION**

*Dedicated to the promotion and protection of the most exciting and profitable alternative agriculture endeavor today...*

## **RAISING ELK FOR FUN AND PROFIT**

NAEBA  
1-7-93

SO. CENTRAL ELK BREEDERS ASSOCIATION  
APPLICATION FOR MEMBERSHIP

NAME: \_\_\_\_\_ RANCHNAME: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_ DAY PHONE: (\_\_\_\_) \_\_\_\_\_  
CITY, STATE, ZIP: \_\_\_\_\_ EVENINGPHONE: (\_\_\_\_) \_\_\_\_\_  
NUMBER OF ELK OWNED: \_\_\_\_\_ FAX PHONE: (\_\_\_\_) \_\_\_\_\_

- I am applying for:
- SCEBA FULL MEMBERSHIP. Full voting rights, you must currently own elk. \$ 100.00 annually
  - SCEBA ASSOCIATE MEMBERSHIP. No voting rights, not open to elk owners. \$ 75.00 annually
  - NAEBA FULL MEMBERSHIP. Full voting rights, you must own elk. \$ 150.00 annually
  - NAEBA ASSOCIATE MEMBERSHIP. No voting rights, not open to elk owners. \$ 75.00 annually

MAIL CHECK AND APPLICATION TO:

South Central Elk Breeders Association  
Route 2, Box 200 A  
Taylor, Texas 76574

Total Enclosed: \$ \_\_\_\_\_

Signature: \_\_\_\_\_

ECONOMICS

- Elk are more efficient converters of forage and feed than cattle and domestic livestock. Elk eat about 1/3 as much as cattle and are worth more than 3 times as much per head. 70,000 years of adaptation makes them a most efficient converter of natural forage to high protein, low cholesterol meat. Feed required to produce 1 lb. of beef will produce 1.6 lbs. of elk venison.
- Today's economic climate is making it difficult for the farmer to make a profit. Increasing and unfair competition for markets has forced farmers to look for alternative products and markets. The elk industry is small now but has great potential for continued growth. Economic projections are good for the industry, even given the small herd size today, within 10 years the potential for velvet and meat sales are in the millions annually. At these levels of return, the farmer can prosper.
- Elk meat has long been considered the premier venison. With changing demand from consumers for lean meat with high protein and low cholesterol a continuous growing demand for elk venison is assured.
- Elk venison has all the requirements to become the meat of the 1990's. It fits all the needs of the modern consumer. It is lean, low in fat, low in cholesterol and high in protein in addition to tasting great! Farmed venison commands a premium over all other meat products. The U.S. imports over \$20 million worth of venison annually from New Zealand at the present time. The U.S. already has a ready market for elk venison, all we have to do is produce it.
- Elk raising is less labor intensive and requires less "hands on" management than conventional livestock endeavors once the facilities and animals are in place.

BENEFITS

- Elk farming/ranching is sustainable and environmentally friendly. Pastures require little renovation or alteration of land surface before utilization. Most cover can be left since elk make good use of it for both shelter and food.
- Elk raising conserves the soil by leaving it in grass rather than tiling it each year and exposing it to erosion by wind or water. Elk use native grasses and browse as an integral part of their diet.
- Elk raising has great potential for increasing productivity on tracts of marginal land not otherwise suited for traditional farming methods.
- Elk readily adapt to farm life and become quite docile and easy to handle if the producer is gentle with them. Elk respect fences and do not try to escape.
- Elk thrive on most types of hay and grasses, including alfalfa. Grain is not required but they will benefit from grain following the breeding season and during the winter. Elk do not require barns but will require shade and will prosper with access to ponds, lakes or streams. Two elk can easily be pastured on 1 acre of improved grass pasture.
- Both sexes give the farmer economic return, the females produce calves and the males provide revenue by sale of velvet antlers that grow back each year - you don't have to slaughter the animal! Nature's perfect renewable resource.
- Velvet sales to Asian countries can help improve the balance of trade and bring dollars back into the U.S. from Asia. You can feel good that you are producing a product that someone wants to buy and not receiving a governmental subsidy that must eventually be repaid by our children.

ELK FACTS

- Mature Bulls average 900 lbs. to 1100 lbs.
- Mature Cows normally weigh 600 to 700 lbs.
- Average life span of an elk is 18 years.
- The breeding season, or rut, begins in August and peaks in late September or October. Young bulls are sexually mature at 2 years old but breeding is more successful at three. Mature bulls can service 20 - 30 cows per season. Bulls contest for dominance through bugling, sparring and chasing, however, injuries are rare.
- Cows can be bred at 18 months old and mature at three years old. Elk gestation is about 250 days, calves are usually born in June and July. Cows will leave the herd for approximately 10 days after giving birth and prepare the calf for life in the herd. Most breeders wean their calves at three to four months of age.
- Elk are hardy livestock with natural immunity to most diseases. Although elk can contract normal cattle diseases, they are not prone to get them. Available cattle medications and vaccines can be used for elk.
- There is a substantial international market for the sale of velvet antler (harvested in early stages of growth). Koreans and other Asian countries use elk velvet for many pharmaceutical applications. Velveting of bulls is preformed by veterinarians and is a humane process using anesthetic. Antlers harvested in the velvet stage can weigh 20 to 25 pounds.

HOUSE AGRICULTURE  
1-27-93  
ATTACHMENT # 2-2



## THE NORTH AMERICAN ELK BREEDERS ASSOCIATION

The NAEBA is a non-profit association founded to promote the elk ranching industry by educating its members and the general public in proper management and breeding practices. It is the philosophy of this association to share the fantastic rewards its members have experienced with diversification from traditional agricultural operations through elk ranching.

With 650 members, the association has become the voice of the industry, and serves its members in many ways. Among these are: the maintenance of a pure-bred elk registry; providing a quarterly full-color magazine, and association newsletters; keeping them informed as to governmental decisions; assistance in marketing, and much more.

If you would like more information on elk ranching please contact the NAEBA office.

### NAEBA

7301 NW Tiffany Springs Road  
Suite 1104

Kansas City, MO 64153

1-816-746-5700

## OTHER ELK FACTS

- Bulls normally weigh 900 to 1,000 pounds.
- Cows normally weigh 600 to 700 pounds.
- The average life span of an elk is 18 years.
- Elk are hardy livestock, with natural immunity to most diseases. Animal health practices for elk are almost identical to cattle.
- Elk will cross with the European red deer.
- Elk will not cross with mule or white tail deer.
- Elk antlers fall off each year in March or April and begin new growth immediately.
- There is a substantial international market for the antler when cut in its early stages of growth (velvet).
- The velvetting of bulls is performed by a veterinarian and is a humane practice using anesthetic.
- Antlers harvested in the velvet stage can weigh 20-25 pounds.
- In 1990 Grade A velvet brought \$110 per pound on the farm.
- Koreans and Asians use elk velvet for many pharmaceutical applications.
- The breeding season, or rut, begins in August and peaks in late September or October. Young bulls are mature at two years, but most successful breeders begin at three years. Cows can be bred at two years, and are mature at three years of age.
- Elk gestation is about 250 days and calves are born in June or July. Cows will leave the herd for approximately 10 days while dropping and preparing the calf for life in the herd. Most breeders wean their calves at three to four months of age.

# The NORTH AMERICAN ELK BREEDERS ASSOCIATION



*Challenges  
FFA Chapters & Members  
to experience one of  
North America's newest  
forms of ranching  
ELK RANCHING*

AH 3-  
1-27-93  
N. Ag

## BACKGROUND

Widely known for their majestic beauty and regal stature, elk have freely roamed vast portions of North America for over 40,000 years. But, what most people don't realize is that elk are being raised domestically on farms and ranches in almost every state and province. Welcome to one of North America's most diverse forms of ranching. . . elk ranching.

Endemic to only North America and Siberia, the elk is among the largest of the cervidae (deer) family and is often called "Wapiti", the correct designation for the North American species.

While game ranching is relatively new in North America, it is as old as farming itself in most European countries. In ancient times, the nobility in some European societies often had private game ranches. The Romans were active game ranchers throughout their history, and several references were made to game ranching in the Holy Bible.

Today, it is a well-known fact that venison is the preferred meat of most Europeans, and it is quickly gaining acceptance in the U.S.

Game ranching has been practiced in North America since before the turn of the Century. With the current interest in low-fat and low cholesterol meats combined with the need for alternative sources of revenue in agriculture, game farming and ranching is beginning to play a much larger role to producers as they experience the benefits of this industry.

## OTHER CONSIDERATIONS

• The primary markets for domestic elk are:  
1) Breeding Stock - A common form of elk ranching is a cow/calf operation much like the traditional cattle ranches in the United States. Elk breeders often sell their calves to breeders starting new herds. 2) Velvetting - Harvesting the antlers on the mature bulls is a common and viable market for many ranchers. Velvetting refers to the practice of harvesting the elk antler before it becomes hard. Done properly velvetting doesn't harm the animals and can be done each year. 3) A future venison market is developing for elk meat due to its leanness and taste.

• Elk handle much like cattle and can be enjoyable, rewarding and profitable. They eat 1/3 as much as cattle and love corn, oats, and alfalfa pellets. Grain is not normally required but elk, like all livestock, benefit from grain following breeding periods and during winter. Elk thrive on most types of hay and grasses, including alfalfa. Fescue is not recommended during calving period because it doesn't meet nourishment needs for milk production in cows.

• Elk require no barn-type housing, but must have a higher confinement fence than cattle (state requirements vary regarding fencing). They need some shade, and prosper with access to ponds, lakes or streams. Three elk can be maintained in the same area required for one domestic cow.



### NORTH AMERICAN ELK BREEDERS ASSOCIATION

7301 NW Tiffany Springs Road, Suite 1104  
Kansas City, Missouri 64153  
1-816-746-5700 \* FAX 816-746-1822

### APPLICATION FOR JUNIOR MEMBERSHIP

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY, STATE, ZIP \_\_\_\_\_  
PHONE \_\_\_\_\_

For only \$25 you can become involved in elk ranching as a junior member and receive the NAEBA quarterly magazine and other interesting information on elk ranching. Ages 18 and under.

*HOUSE AGRICULTURE*  
*1-27-93*  
*ATTACHMENT #3-2*





# NAEBA News

The Official Newsletter of the North American Elk Breeders Association

Suites 1104 & 1106 • 7301 NW Tiffany Springs Road • Kansas City, MO 64153 • (816) 746-5700

## Don't Miss This Opportunity...

The Convention committee has arranged for our conventioners to tour the Vanny Cook estate and Game Ranch. This 440 Acre Ranch was established in the late 1950's, early 1960's, and is a show place for African Exotics and North American Game animals, including elk, white tail deer, black buck, water buffalo and more.

This ranch has **RESTRICTED** access, so this is an opportunity you do not want to miss during the convention. The tour and BBQ is Wednesday, February 3, 1993, 2:30-6:30 pm. The cost is \$40.00 per single, \$70.00 per couple (members). And \$50.00 single and \$90.00 per couple for non-members.

## Raffle Review

The Response to the Raffle has been great...and remember someone is going to win so it might as well be you, but you can't win if you don't PLAY!!!

The following are the five prizes that were not listed on the tickets:

- 1) Two piece ensemble-2 elk ivory teeth etched with elk head, trimmed in gold pendant and matching pin
- 2) \$500 cash
- 3) \$500 cash
- 4) PNEU-Dart Tranquilizer Gun
- 5) Three rolls of Game fencing wire

## Assessment Update and Reminder

It is imperative that the herd assessment funds be submitted. These funds are used for the ongoing fight against those who oppose elk ranching on a state and national level. This battle effects all of us and needs the full support of all elk owning members. If you have not paid your assessment, please re-read the November/December '92 NAEBA Newsletter and the USAHA reports in this newsletter. All states are effected, remember the domino theory...what happens in one state will effect all other states.

## Happy New Year!

**IMPORTANT:**  
Please make sure your travel agent arranges your flight to Harlingen, TX Airport for the Convention

## Convention Weather Report

January 9, 1993

South Padre Island, TX.  
Sunny, Clear Skies, 85 Degrees

Kansas City, MO  
Blizzard Conditions, 12 Degrees and 8" of snow on the ground.

What was the weather like in your area?

## September 1992 Lolli Brothers Sale

Elk

A very good auction. The better quality and full blood elk brought markedly higher prices.

The First Annual Elk Show was held.

Adult Bulls ..... \$4000-\$6750

*No Guaranteed bred cows offered at this time*

Adult Bulls ..... \$3000-\$5500

Individual Grand Champion Show Bull ..... \$9000

1992 Heifers, full bloods with Wyoming Lab ..... \$1500-\$3100

Bulls, very outstanding group of 1991 Bulls  
Top Bulls ..... \$2000-\$4000

Lesser quality Bulls ..... \$750-\$1600

1992 Bulls ..... \$1000-\$2000

## December 1992

Elk

A very good run. 75 head sold plus 75 hybrids & red Deer. Prices good on quality and purity tested elk.

1992 Heifer calves, purity tested \$3500-\$4500

Adult cows, purity tested (No top quality offered, mainly older animals) \$2000-\$4600

Bull calves, purity tested \$1000-\$2000  
Adult Bulls (No outstanding offered) \$2000-\$3000

HOUSE AGRICULTURE

1-27-93

ATTACHMENT #4

## Regions and their Representatives...

**The Northwest Quadrant** • Regional Director is Steve McGrath,  
TEL (208) 523-5933 FAX (208) 529-4166 and it shall consist of:  
AK, WA, OR, ID, MT, WY, ND, SD, NE

**The Northeast Quadrant** • Regional Director is Jim Pankow,  
TEL (414) 892-6753 FAX (414) 892-6472 and it shall consist of:  
MN, WI, MI, IA, IL, IN, OH, PA, NJ, NY, CT, RI, MA, VT, NH, ME

**The Southwest Quadrant** • Regional Director is Steve Wolcott,  
TEL (303) 527-4586 FAX (303) 527-4586 and it shall consist of:  
KS, OK, TX, NM, CO, UT, AZ, CA, NV, HI

**The Southeast Quadrant** • Regional Director is Bob Hamilton,  
TEL (813) 924-9249 FAX (813) 365-5854 and it shall consist of:  
MO, AR, LA, MS, TN, KY, AL, GA, NC, SC, WV, VA, MD, DE, FL  
CANADA, Director Ed Lakusta (403) 240-4997 FAX (403) 242-3872

**ADVERTISING DEADLINE  
FOR THE NEXT ISSUE OF  
THE  
NAEBA JOURNAL IS**

# FEBRUARY 20

contact the office to reserve  
your advertising space  
**NOW!**

## (816) 746-5700

### Dear NAEBA,

I would like to share a couple of experiences I had in the beginning of my Elk farming career last spring. I purchased two cows and one spike bull from Robert Johnson, Sr. of Hardrock Game Farms. Several days after the elk arrived, one cow started showing signs of being sick. My veterinarian and I did what we could, but she died a couple days later.

When I called Mr. Johnson and told him what happened, he said he would replace her, I was grateful. The other cow had a beautiful heifer calf later on.

After my replacement cow arrived, I was shocked to see her abort her calf a couple days later. When I told Mr. Johnson this he said he would give me a bull calf.

My Elk farming career got off to a shaky start, but thanks to Robert Johnson Sr. my heart and enthusiasm are still in the industry.

Joe Eugster  
Majestic Monarchs

## Calling All Hunters

North American Elk Breeders Association is forming a committee of hunters and elk ranchers who are members of hunting organizations to respond in an organized and informed fashion to adverse elk ranching articles, and inaccuracies about our industry that appear in hunting magazines.

Hunters need to respond to these articles for several reasons:

- 1) They can relate to readership
- 2) They may be recognized not only as hunters, but also elk owners
- 3) They are more apt to be published as a member of the hunting fraternity.

Please Contact:  
Ronna Fuller, Nevada  
(702) 266-3300  
Wade Hainstock, NAEBA  
(816) 746-5700

## The Winners of the NAEBA Membership Contest:

### 1st Place Winner

Rush Johnson-87 points-One free convention registration and one full page in the NAEBA Journal.

### 2nd Place Winner

Craig Stefancko-16 points-One free half page Ad in the NAEBA Journal and \$50.00 gift certificate from Jeffers Pet Supply.

### 3rd Place Winner

Sam Withiam-12 points-One free Quarter page Ad in the NAEBA Journal.

Congratulations to the winners and a special thank you to all those who participated in the contest.

## The Grizzly Discovery and Conservation Center...

...is set to open in West Yellowstone Montana in May-June of this year. In one section of the exhibit we would like to have some of the representative prey species of the grizzly bear in the Yellowstone.

This could include elk calves, ground squirrels, marmots, pocket gophers, etc. Specifically with your organization, I would be looking for an elk calf specimen that may have died-stillborn or other that I could prepare as a taxidermic mount for the exhibit. I am hoping one of your members might have saved and frozen a calf they lost from their herd. If I can't find one, we would also be interested in a mount, if it already exists and is in good condition that we could acquire. I appreciate your help and please feel free to give me a call if you have any other questions.

## Contact:

Curt Hadland  
Images of Nature Studies  
15280 Pilar Road North  
Scandia, MN 55073  
(612) 433-2002

## Saturday, October 31

Steve Wolcott and Jim Rich meet with national Cattlemen's Association TB working group to discuss TB in Cervidae and the current TB problem with Mexican cattle imports.

## Sunday, November 1

Presidents reception Steve, Jim, and I start talking with various leaders of USAHA about having "captive wildlife" taken out of the Wildlife Diseases Committee and put into a new or existing committee more related to livestock diseases. We also talked about the UMR proposals for Cervidae and NAEBA's indemnification proposal.

## Monday, November 2

Wildlife Diseases Committee A resolution is made to take the expression Captive Wildlife out of mission statement and all responsibility for Captive Wildlife removed from Wildlife Diseases Committee. Motion is seconded by me, Dave Whittlesay and then discussion about reasons for this motion. Producers say they feel that Wildlife professions and officials are using disease as a false issue in attempting to control and even eliminate game farm animals particularly in the western states. Wildlife people in the committee fee. We are being over sensitive. However producers and various state and federal regulatory people feel that the diseases affecting game farm animals are the same that face conventional livestock producers in general. Vote is called and motion is passed. A second motion is made and then passed to have game farm and related type animals called alternative livestock and that the Wildlife Diseases Committee be given the charge for these animals until USAHA puts them into another or new committee. The Wildlife Diseases Committee will also recommend that this change happen.

## Tuesday, November 3

Steve and I meet and talk with Scott Petty of NADeFA and EWA and Chick Rives, outgoing Executive Director of EWA about how the various groups can come together and have a unified front with USAHA about TB. NADeFA's concerns are about allowing the use of the BTB test as an ancillary test at the producer's option and expense in place of the CCT after a suspect reaction to the SST. They also want the NAEBA indemnification to be truly optional with

producers having the choice of NAEBA's proposal, private insurance, or a waiver signed by the producer releasing any governmental entity for any responsibility concerning TB, quarantine, or etc. Tuesday evening we have dinner and go through the USDA draft proposal for Uniform Methods and Rules for Cervidae. Those present were Raleigh Buckmaster, Scott....incoming director of EWA, and Dr....EWA member Dr. Don Davis and Joe Templeton of University of Texas who have done a lot of research on TB and Brucellosis on game animals both farmed and wild. NAEBA members present are Sam Withiam, Steve Wolcott, Jim Rich, Dave Whittlesay, and Ferry Woodall NAEBA member and Veterinary practitioner from Oklahoma. We went through the UM&R point by point and came up with recommendations which we presented to the TB Committee the following day. Our meeting lasted to about 1:30 am and continued the next morning for a couple of hours.

As we find time and opportunity we also are talking to the USAHA staff about getting Allied Industry status which will get NAEBA a seat on the Executive Council of USAHA. We were successful in this effort and will have a seat as of November 6, 1992.

We also are lobbying people such as Dr. Haggerty who is the new president, Dr. Alley outgoing president, Joe Finley new president elect. Dr. Card who is chairman of the infectious Diseases of Cattle, Bison, and Llama along with as many State Veterinarians as we can about having a new committee for alternative livestock formed or to have us added to the cattle bison and llama committee and possibly change the name to Infectious Diseases of Cattle and Alternative Livestock. There is also talk of starting a Small Ruminants Committee which could include game farm animals but the consensus of the USAHA leadership is to streamline rather than to expand. There is therefore a good possibility of the committee of cattle and alternative livestock being formed.

## Wednesday, November 4

The TB committee meets and the Cervidae proposal is gone through and discussed quite quickly. Then a sub-committee is formed with Steve Wolcott and Raleigh Buckmaster representing industry with various state vets and USDA and TB experts also present. I did not attend these meetings so Steve will have to give you the details.

## Thursday, November 5

The TB committee continues with most of the time spent on the Mexican cattle situation. At the end of the meeting the sub-committee's recommendations are read and accepted. NAEBA then introduced a resolution urging USDA and government to accept our indemnification proposal with the compromises worked out with NADeFA and EWA concerning voluntary status, waiver, and private insurance options. NADeFA members present seconded motion and it passed.

## Friday, November 6

I was told we had been accepted for Allied Industry status. I wrote a short acceptance letter because I had to catch my plane before their meeting.

I also want to tell you that Pete Lies of N.D. was present at this meeting and was very helpful particularly in the Wildlife Diseases Committee. Also Jerry Woodall gave Jim, Steve, and I some very useful advice and technical help all through the meeting. Sam Withiam was his ever helpful self and was involved with resolving issues with NADeFA and EWA and helped all through the meeting by meeting people and representing NAEBA throughout the meeting.

Jim Rich was extremely helpful due to his long involvement in government and these issues. He spent many hours each morning working with the NCA's TB working group and was instrumental in their developing policy for not just cervidae but all ruminant farmed stock and his efforts should have far reaching consequences for NAEBA in the future as we deal with new challenges with animal health.

Finally I would like to say that this 1992 USAHA meeting was long and grueling for all of us there but we were told repeatedly by state and federal people and the USAHA leadership that they were extremely grateful for our efforts and the way we are trying to take responsible action to solve animal health issues for not just our own animals but all livestock represented at USAHA. Also, we need to send a list of NAEBA members to add to USAHA's rolls for us to keep our allied industry status, and we need to reimburse Jim Rich for the check he wrote to cover our new members and the allied industry status.

# Report On the USAHA Meeting November 1991 Kentucky

by: Steve Wolcott

In the weeks leading up to this year's USAHA meeting, NADeFA and NAEBA Animal Health Committees had entered into a dialogue in an attempt to heal the rift caused by disagreement over NAEBA'S TB Indemnity Bill. Both Associations agreed that airing our disputes publicly hurts the industry that we are here to serve and is a luxury we cannot afford. Representatives from both groups had started work on a common position regarding USDA protocols for TB that we would want enacted. Then, just days before we left for the meeting, what should come Federal Express but a Draft USDA Addendum to the Bovine Tuberculosis Eradication Uniform Methods and Rules for Bovine Tuberculosis Eradication in Cervidae, 21 pages of it. Well, this is what both NAEBA and NADeFA had been asking for, and wondering if we were ever going to get. What seemed like glacial speed to us, was actually a fairly rapid response by Federal Government standards. Industry action deserves the credit.

Receipt of the Uniform Methods and Rules (UM&R) quickly focused the discussions of NADeFA and NAEBA Animal Health Committee members. Here was a document that we would have to live and work with, that would shape the cervid industry for years to come. After penciling in my comments, I caught Raleigh Buckmaster of NADeFA just as he was walking out the door. He had the same basic pencil marks. The night before the meeting of the TB Committee, the NAEBA and NADeFA members attending the USAHA meeting sat down for a working dinner. Also attending were the exciting and entering executive directors of the Exotic Wildlife Association and a couple of EWA members. We went through the UM&R line by line and agreed on the changes we would like to see. This took until about midnight. We ten tackled the indemnity issue and produced a joint resolution to submit to the TB Committee. We also agreed on some principles to guide the indemnity legislation and regulation writing efforts. I believe this dinner meeting was a real turning point in the relationship between our industry groups. Working together on a common task helped us forge personal friendships and develop common industry goals.

The USADA TB Committee adopted 4 pages of amendments to the UM&R and recommended that the USDA proceed to incorporate the UM&R into the Code of Federal Regulations. It then recommended that the USDA issue the UM&R, with one modification, as Recommended Guidelines to the State Veterinarians to use until the UM&R is formally adopted as federal regulations. Final adoption of the UM&R will probably occur summer '93. Comments are now being

solicited from USDA Area Veterinarians to use until the UM&R is formally adopted as federal regulations. Final adoption of the UM&R will probably occur summer '93. Comments are now being solicited from USDA Area Veterinarians, then a draft will be issued for a public comment period. This 20+ page document will have a significant effect on our business. Some of our suggestions were adopted, and some were not. Some of these are more important than others. I will outline the UM&R highlighting what I think are some of the more important sections. If you want a full-copy, contact the office.

The UM&R includes the BTB test as an official TB test. The Single Cervical test remains the primary test, but when an animal reacts to the single cervical, you would be able to choose either the Comparative Cervical Test (CCT) or the BTB (at your own expense). You would have to live with the results of whichever test you chose. The BTB was included with the anticipation that the study now underway by the USDA and AgCanada will show it to be at least as good as the CCT. If not, it will be dropped, but the fact that it was included that preliminary results of the study are favorable. The study should be released in April.

The method of reading the CCT has also been modified. Based on the results of the many deer and elk tested with the CCT over the past 18 months, the changes were made to make the CCT more accurate, primarily to reduce the number of false positive results which were showing up mostly in the eastern half of the country and Texas. As it stands now, a CCT test is considered positive if the bovine response is equal to or greater than the avian response, no matter how small the response is. The new method calls a CCT test positive when the bovine response is 1 mm or greater and is 0.5 mm greater than the avian response. Animals which would have been classified as reactors under the old method, but are negative under the new method will be classified as suspects, retested after 90 days, and classified under the old standards (equal to or greater than).

The UM&R sets standards for testing for interstate movement and for several herd status classifications. Accredited herds must pass 3 whole herd tests conducted at one year intervals, and then must conduct a whole herd test every second year thereafter to maintain this status. Animals from Accredited herds can move interstate with no further testing. A qualified herd has undergone a whole herd test within the last 12 months but is not yet accredited. Animals from Qualified herds can move interstate if they have been tested within 90 days prior to shipment. A Monitored herd has undergone at least 3 years of slaughter surveillance at an approved slaughter facility. The numbers required to be slaughtered are contained in a chart, and decrease as a percentage of herd size as the size of the herd increases. A herd of 100 animals would have to slaughter 17 animals/year, a monitored herd can move interstate if they have been tested within 90 days prior to shipment. All of these herd classifications have requirements for animals entering the herd to be infected or exposed,

animals can be moved interstate if the... no TB tests at least 90 days apart, the second test being within 90 days of shipment, and if the animals were isolated from all other members of the herd during the testing period. These are known as satellite herds.

Of course, the Monitored herd status is not much help to the elk industry because we are not slaughtering any number of animals at this time. So we will have to use either the Accredited/Qualified status or use the satellite herd method. We tried to get the requirements for Accredited herds reduced. We were unsuccessful because these are the same standards used for cattle. Now my best idea for reducing testing requirements is to set standards for individual states to be classified as TB-free in cervids which would then reduce or eliminate testing for animals coming out of these states.

What happens if you have a number of animals classified as reactors by the Single Cervical and then by the CCT or BTB? The UM&R spells out what happens if the herd is not depopulated. It does not address indemnity, which must be provided for in Congress. If you kill the reactors, and no lesions are found and TB is not cultured, you are released from Quarantine. If you kill the reactors and compatible lesions are found but TB cannot be cultured, you may be released from quarantine if the whole herd tests negative after 90 days. If TB is confirmed in the herd when you kill the reactors, you remain in quarantine until you pass three consecutive whole herd tests (Single Cervical only) at 180 and 180 day minimum intervals. After release from quarantine, five annual whole herd test shall be given.

These are just some of the highlights. As you can see it is a complex document. I would urge any of you who are interested to review the entire UM&R. If necessary, I believe we can live with it as it is. We may be able to improve it. In any case, the UM&R will stop the spread of TB in cervidae and hasten its elimination. Just as important, it will help with perceptions: that the USDA considers deer and elk livestock just like cattle and that TB will be eliminated because the USDA has taken charge. It will also help to have uniform testing requirements instead of the crazy situation we now have with every state having different and constantly changing requirements. The downside is that the testing requirements are more difficult to meet. We will continue to search for a better solution, but we may have to live with these regimens for a while to be sure TB is eradicated.

The big missing piece is still indemnification. We plan to return to Congress early this year. Some of our groundwork was covered last year and we have the prospect of going with the support of NADeFA and possibly EWA which will help. Hopefully opposition will not arise from other quarters, i.e. opponents of the industry.

I hope to see you all at Padre Island. Come prepared to discuss the UM&R and the approach we should take during the public comment period.

## West Coast Exotic Animal & Pet Show

Dane & Jan Smith  
3500 Cedar St.  
North Bend, OR 974459  
(503) 756-3683

Doug Bos  
PO Box 39  
Clive, Alberta  
Canada TOCOY  
(403) 784-3400  
FAX (403) 343-2199

November 1992

### Dear Fellow Exotic Animal Enthusiasts,

The 3rd Annual West Coast Exotic Animal Show is scheduled for April 30th, May 1st, and May 2nd, 1993 at the Lane County Fairgrounds in Eugene, Oregon. We are anticipating this year's show to be bigger and better than our two previous shows. We will be running the show in the same format allowing exhibitors to show and sell animals by private treaty on Friday evening, Saturday, and Sunday, and will be adding an **EXHIBITOR'S SELECT AUCTION** on Sunday afternoon for those exhibitors who desire to sell their animals in an auction setting. We will also be providing space for **ASSOCIATION SPONSORED SHOWS**. We are very excited about the addition of an auction and are hopeful that several of the various associations will sponsor shows for their membership to participate in.

Because of our national advertising schedule which will start in January of 1993, we are looking for associations who are willing to commit to an **ASSOCIATION SPONSORED SHOW** of their particular species so that information may be included in the national advertising. Any association wishing to participate should call one of us at the above phone numbers before December 31st, with the specifics of their show needs.

This year's show will also include an auction of select animals from those breeders participating in the show. We will be requiring health and reproductive guarantees on all animals sold in the auction. This is intended to be an **EXHIBITOR'S SELECT AUCTION** and will reflect the high quality we have tried to maintain in our past shows in the auction aspect of this year's show. We will be asking for consignments to the show prior to March 1, 1993, so that a cataloguing of animals and distribution of the catalogue can be accomplished prior to the April 30th show opening. Please contact either Doug or myself as soon as possible regarding either 1) the organization of an association sponsored show or 2) your desire to consign animals for the auction, which will take place during the afternoon on the last day of the show.

## Minnesota Elk Breeders Association

### News Update to NAEBA

On December 5, 1992 approximately 55 people met at the Whitney Senior Citizens Center in St. Cloud, MN for the organizational meeting. We decided to call our association the Minnesota Elk Breeders Association. Our purpose is to support the following objectives:

- a. To promote production agriculture of domestic elk
- b. To work with the Minnesota Department of Agriculture and Minnesota Department of Animal Health for Disease Control
- c. To seek and support legislation to place domestic elk under the Minnesota Department of Agriculture
- d. To encourage and support membership in NAEBA and the Minnesota Deer Breeders Association.
- e. To improve the quality and care of domestic elk

After voting by ballot, the newly elected board members are as follows:

President ..... Cliff Mulder  
Vice President ..... Lorin Heins  
Secretary-Treasurer ... Cheryl Kruckeberg  
Director ..... Glen Zebarth  
Director ..... Don Kaplan

The board also chose a Legislation Committee and the members are as follows:

Glen Zebarth, ..... Chairman  
Pierce Serrin  
Gary Tank

Cliff Mulder ..... 507-825-3575  
Lorin Heins ..... 507-534-2076  
Cheryl Kruckeberg ..... 507-583-7109  
Glen Zebarth ..... 612-524-2564 or  
612-762-1575  
Don Kaplan ..... 507-276-4716 or  
507-267-4338

## 1. Conversion of the Board of Directors

From the founding fathers to a representative elected body is essential for the development of the organization. NAEBA has to have a strong regional and local input to respond effectively to the need of its members. In 1993 (1/3) one third of the remaining regional board will be drawn off by lot. Regional meetings will be held Thursday February 4 to elect one board member from each of NAEBA's five regions.

All interested members from each region are encouraged to attend the 1993 convention and participate in the democratic process. It is incumbent on all perspective board members to understand the responsibility and commitment they are making for the next (3) three years. The industry and the association are poised to enter a time of unparalleled growth. The raising of elk over the next (3) three years will move from fringe agricultural into the best agricultural idea to hit North America since the importation of beef animals. The road will not be a smooth one however, requiring time, energy and the expention of money on the part of our directors. There needs to be, (1) strong national organization, (2) strong international organization, (3) strong local organization, for the development of the industry. Get involved at the level you feel comfortable with.

## Continued Update from MEBA

by Cliff Mulder, President; Minnesota Elk Breeders Association

I was informed yesterday by Glenn Zebarth, chairman of the M.E.B.A. Legislative committee, that Senator Charles Berg had informed him that he had a bill started, and it would have a file number assigned by Thursday, January 14.

This bill would take elk and red deer out of the Department of Natural Resources and place them under the Department of Agriculture, classifying them as livestock. The Minnesota Elk Breeders Association and the Minnesota Deer Breeders Association have retained an attorney to watch over this bill. The attorney will also check on the Department of Natural Resources for any restrictions that they might make on elk and deer ranching.

On Saturday, January 9, 1993, the Board of Directors and the Legislative Committee of M.E.B.A. met together to go over recent meetings that several of us had previously attended. This proved to be a very informative meeting and a lot of work was accomplished.

**Scott D. McRuer & Co.**  
**CERTIFIED PUBLIC ACCOUNTANT**

January 14, 1993

Dear NAEBA Members;

I have recently been engaged to provide the North American Elk Breeders Association, Inc. with CPA services. My duties include providing the Association's Board and management with monthly financial information, assisting Association staff with payroll and business tax compliance, preparing the Association's year-end income tax filings and other projects as needed.

I am contacting you regarding a special project I have been requested to perform. The Association's management requested that I randomly select directors who will be rotated from the board according to the Association's bylaws. I am writing to explain the selection criteria I was given, the selection method I followed and the selection results.

Selection Criteria:

The Association's bylaws provide that twelve directors serving on the board should be rotated off annually, and five directors should replace them. Since four directors have resigned during the year, we only needed to select the remaining eight names.

Selection Method:

I conducted the selection at my office on January 5, 1993 at 10:45 CST. My selection was witnessed by Wade Hainstock-NAEBA Executive Director, Paulette Dawson-NAEBA Operations Manager and my assistant Patricia Misner.

My goal was to use a simple selection method. I assigned a number to each of the twenty remaining board members, wrote the numbers one through twenty on slips of paper, and placed them in a hat. I shook the hat thoroughly, then asked my assistant to select a number without looking at the slip. Once she selected a number, I recorded the number and selected the board member whose name corresponded to that number for rotation off the board.

After each selection, we replaced the previously selected slip in the hat. This way, each slip had an equal (i.e. one in twenty) chance of selection. If we selected a slip representing a name already selected, we replace it and selected again. We followed this process until we selected eight names.

Selection Results:

Our selection resulted in the following individuals rotating off the board of directors:

<u>Name</u>	<u>Comments</u>
Watha Ard	previously resigned
Summer Erdman	previously resigned
Dan Rodreick	previously resigned
Dale Michel	previously resigned
Joe Cano	selected
Mike Ferguson	selected
Ward Goff	selected
Lorin Heins	selected
Bob Johnson, Jr.	selected
Steve Musick	selected
Monte North	selected
Dave Whittlesey	selected

I would be happy to answer any questions regarding the selection criteria, section process and final selection. I look forward to working further with you in the future!

Sincerely yours,  
Scott D. McRuer, CPA

6506-B Northwest Prairie View Road Kansas City, Missouri 64151 (816) 741-7882

# DATE FROM J. RICH, WASHINGTON

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## FACT

The North American Elk Breeder's Association (NAEBA) took the lead in working with government agencies and other livestock associations to lay the frame work for a national TB eradication program in Cervidae (all members of the deer family, i.e., elk, deer, moose, reindeer, etc.) Standards virtually identical to those which have existed in the cattle industry for 75 years will be embodied in federal and state regulation over the next six months.

NAEBA's government liaison and animal health committees actively worked throughout the year to have elk and all deer included in the national bovine tuberculosis eradication program. In conjunction with the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS); the U.S. Animal Health Association (USAHA); and other livestock associations including the National Cattlemen's Association, USDA presented draft uniform methods and rules (UM&R) for the eradication of TB in Cervidae at the annual meeting of USAHA in Louisville, KY in November. This is the most important hurdle for adoption of new rules governing animal health in animal agriculture in the United States. The rules are virtually identical to those which have applied to cattle for virtually 75 years with significant exceptions that improve their applicability to Cervidae. Special recognition of new testing, slaughter surveillance and procedures for large ranches in which whole herd testing is impractical is afforded the cervid industry. Changes to the cattle UN&R next year will probably be considered.

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## FACT

NAEBA has lead the effort to enact a government/industry insurance program for indemnification of losses suffered through destruction of animals to eradicate disease, specifically tuberculosis. NAEBA's goal is to ensure availability of insurance to every producer on a voluntary basis to preclude financial ruin should disease or exposure occur.

Congressman Wayne Allard, Colorado, introduced HB 5775, a national TB insurance program for the eradication of TB in elk, in the last congressional session. After months of work to try to achieve a consensus among the associations representing the cervid industry, it was necessary to restrict coverage to only elk in an effort to avoid objection by the North American Deer Farmer's Association and the Exotic Wildlife Association. This proved futile. The Chairman of the House Subcommittee on Livestock, Dairy and Poultry, Charlie Stenholm, called for a public hearing in August to try to get to the bottom of the TB issues facing animal agriculture as a whole. It was clear that a solution that recognized only elk was not of interest to the committee. The objections of the other associations didn't appear to be valid. Subsequent to this hearing, committee staff drafted stronger legislation that not only included all deer but recognized the emerging problems in TB in cattle coming from Mexico and a long standing problem with dairy cows. Since last year was an election year, time simply expired before action could be taken. Similar legislation is expected in the session that convenes in January, 1993. (Elk & Deer farmers have to conform to similar rules as established animal agriculture.) NAEBA will continue its efforts on behalf of it's members this year to enact legislation and promote animal health standards to ensure viability of this industry in the years to come.

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## FACT

There has never been a documented case of transmission of tuberculosis between farmed/ranched Cervidae and free ranging wild deer. (Assessment of Risk Factors for *Mycobacterium bovis* in the United States, USDA: APHIS: VS, November 1992)

Allegations alternative livestock will infect free ranging wildlife with diseases such as TV, brucellosis, malignant catarrhal fever, etc., simply are not true. In the United States there are two reported cases of TB in free ranging wild deer in this century-90 years-both were in white-tailed deer in New York, one in 1934 the other in 1961, and both were associated with TB infected dairy herds. *"There has been no documented instance where M. bovis was maintained in a wild population of Cervidae once the source of the infection in either cattle or free-ranging bison was eliminated."* (Ibid.)

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## FACT

Tuberculosis and brucellosis (*Brucella abortus*), diseases of cattle and confinement, have not been sustained in free-ranging cervid (elk, deer, moose, etc.) wildlife populations. Wildlife populations maintained by man through winter feeding programs **are not** free ranging.

Wildlife populations that must be maintained through winter feeding programs are not free ranging. Brucellosis is endemic in elk in the Yellowstone ecosystem. The disease was introduced in these herds early in this century when cattle where established in the area. The National Elk Refuge, managed by the U.S. National Park Service, was founded in Jackson Hole in 1912 to feed elk separated from traditional winter range. Brucellosis has existed ever since. Elk translocated to Washington, Oregon, Nevada and many other states from Yellowstone came from known infected herds, some of which have had infection rates approaching 60%. The movement of these animals from an infected herd across interstate boundaries would have been prohibited in animal agriculture under the provisions of the national brucellosis eradication program. There is a strong possibility

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... elk introduced were infected. They were allowed to free-range and may have posed a passing threat to other wildlife. The real risk was to domestic livestock until the disease could die out within a generation or so. Winter feeding of free ranging wildlife at populations in excess of that sustained on historical natural habitat is considered an unacceptable risk for the introduction of disease and is discouraged by the Wildlife committee of the U.S. Animal Health Association.

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## FACT

Wildlife agencies use animal health, habitat competition, and hybridization as political tools. Regulations are based on supposition not fact, are punitive, economically infeasible and take protected property without compensation and without due process.

The following are excerpts from a ruling in federal district court in Seattle, WA issued on September 2 by Judge William Dwyer:

*The Wildlife Commission rejected requests to be heard. There was ample time to allow objections. Had that been done the outcome might have been different—for example, the falsity of the reports about tuberculosis which the Commission relied upon might have been revealed. For whatever reason, the commission chose to hear from witnesses invited by it while refusing to hear from the ranchers whose business would be affected.*

Neither TB nor brucellosis have ever been documented as having been transmitted from farmed or ranched deer to wild deer. The argument is advanced that sometime, somewhere at some unspecified future time these diseases, or even worse, some unknown, unimaginable disease today will cross from farmed deer to wild deer and wipe out all wildlife. The sky may fall too. That the diseases feared are also diseases of cattle, sheep, goats, etc. remains unstated. That the risk from introduction of TB to wild deer from cattle is far greater than from alternative livestock is ignored. For how long? Is this special interest advocacy to protect native wildlife limited to a ban on the alternative livestock industry or is it the intent to abolish animal agriculture?

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## FACT

Wildlife agencies act as special interest groups belying the public trust that requires government to act with objectivity and serve all of the people not just a few.

Press releases are inflammatory and emulate tabloid sensationalism instead of objective, unbiased presentation of fact. Press releases announcing a ban on a large part of the alternative livestock industry in Washington were dated June 12, the Wildlife Commission did not meet until June 17 and emergency action was not finalized until June 19. The commission rubber stamped the agency's action.

The subject of commercialization of wildlife had been under study since October 1991. The agency and commission waited until after the legislature adjourned to act. Refusing any input from the farmers affected, the commission enacted emergency regulations that prohibited import, transport, sale or breeding of alternative livestock. Producers in Oregon and British Columbia were denied access to processing facilities in Washington on which they had depended for three years. The court held the regulations were tantamount to a taking. The result of this action is summarized from Judge Dwyer's ruling:

*There is no doubt that protected property interests are affected and diminished by the regulations. Although the emergency regulations are temporary, their practical effect will be to restrict severely and immediately, if not extinguish, the plaintiffs' business. The plaintiffs were entitled to present their objections before this measure, aimed at them, was adopted. The purported emergency nature of the regulations did not justify dispensing with the requirements of notice and an opportunity to comment. No emergency existed that would excuse compliance with any applicable due process requirements of the Fourteenth Amendment.*

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## FACT

NAEBA actively supported a federal court case in Washington state to challenge the state's right to abolish and industry without considering other measures which might have satisfied the state's concerns.

Much of the ruling was favorable and excerpts are quoted as they apply to other issues in this fact sheet. Central to the state's case was the right under a Supreme Court ruling to take action to protect the environment even if the threat is not well defined and even if it is later problem to be negligible. The state need not stand idly if it **perceives** that the environment is threatened—in short, simply saying it is perceiving it and allegation alone without proof is sufficient. Industry argued a more recent case in a federal court of appeals that the state must consider less onerous measures than an out and out ban of the industry. The court in Seattle found in favor of the state with respect to these issues. That even submitting false testimony and denying constitutional rights to due process were acceptable in the face of an articulated but unproven threat. This decision is being appealed by the Mountain States Legal Foundation. The case is expected to eventually reach the Supreme Court and much more favorable outcome on appeal is anticipated.



# Rovans Bakery Restaurant and BBQ

*Formal Reception in foyer of Convention Centre*

## **Thursday's Buffet Menu**

Elk Roast and Bear hind Quarter  
Carver Presentation  
Fallow Deer Ribs  
Smoked over an open mesquite fire served with a light sauce  
Fresh Boiled Gulf Shrimp  
served with Red Sauce in chilled bowls and Ice Sculpture  
Fresh Vegetables with French Onion and Dill Dips  
Fresh Fish Pate' Presentation with Toast Points and Assorted European Crackers  
Medley of Fresh Fruits and Assorted Cheeses  
Chicken Kabobs  
Dessert Table  
German Chocolate Cake, Carrot Cake and Black Forest Cake  
with a large Butter Cream Sheet Cake decorated with the Elk Breeders Logo

## **Friday's Buffet Menu**

A Taste of Texas BBQ Buffet  
The BBQ will be cooked over an open Mesquite fire on Rovans Portable BBQ Wagon  
Wild Boar Ribs  
Elk Brisket  
Fallow Deer Sausage  
Fresh Texas Chicken  
Potato Salad  
Cole Slaw  
Cowboy Beans  
Home Baked Whole Wheat and White Bread  
Pico De Gallo  
Fresh Fruit Bowl  
Hot Apple Cobbler with Whipped Country Cream  
Coffee, Decaf, and Ice Tea

## **Saturday's Buffet Menu**

Bib Lettuce, Tomatoes and Onions  
with Baby Gulf Shrimp  
Vinaigrette or Blue Cheese Dressing  
Sauteed Elk Madellines in a pineapple pear sauce and  
Baked Fillet of White Fish Almondine  
Seasoned Wild Rice  
Asparagus with Hollandaise Sauce  
Carrots and Onions  
Hot Homemade Rolls  
Peach Cobbler with Whipped Cream  
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Adapted from the Australian Red Roar of the Red Deer Society of Australia, Inc. The idea is universal and we at NAEBA changed only the information that does not apply in North America.

## *Promoting Your Elk*

It is the "little things" that count. Even before you start an advertising program, you need to take a look at these basic, up front items. Most of them don't require a big cash outlay, just a little time and effort. Remember that markets don't just happen—they are created.

- Write all correspondence on your elk farm letterhead stationery.
- Have business cards printed that include your name, farm name, stud name, address, phone and fax numbers, and be sure to include elk.
- Start up an up-to-date mailing list of past customers, potential buyers and visitors to your farm.
- Have performance information available on all sale stock as well as their sires and dams.
- Have NAEBA literature available for customers.
- Make sure your phone messages are taken correctly and politely and be sure you return calls as soon as possible.

- Have a farm brochure with you at elk functions to explain your breeding program and to promote your sale stock.
- Put up a elk road sign and place an elk sticker on your truck or trailer.
- Keep some elk in the paddock around your sign or close to the main house.
- Write up a follow-up letter to all buyers and visitors.
- Keep sale stock separate from you own and elk already sold.
- Keep houses, outbuildings, fences, yards, and pastures well maintained and attractive.
- Visit other elk farmers.
- Keep you local banker informed about the elk you have for sale.
- Get to know the owner/manger of your local merchandise store.
- Keep ag college teachers informed of your operation.
- Join NAEBA and use our extensive contacts.
- Sponsor a field day for your local farmers
- Be aggressive, but not abrasive, in marketing.

## **Contact NAEBA Office for Promotional Information.**

*North American Elk Breeders Association*  
Suites 1104 and 1106  
7301 NW Tiffany Springs Road  
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## *Voting Procedures*

The By-Laws of NAEBA do not provide for the use of proxies other than stated in Article V, paragraph 7 as stated below:

7. Voting. (restated and delete current No. 7)  
Every board meeting of the Board of Directors, each director shall be entitled to one vote in person. In the event, that less than majority of the board members are present at any duly called meeting, then and only then may proxy votes be allowed. Said proxy should be by appointed instrument in writing which is subscribed by said director and bears a date of not more than ten (10) days prior to such meeting. Upon demand of any member of the Board of Directors a vote upon any question before the meeting shall be by ballot, all matters shall be decided by majority vote of the Directors present in person or by proxy as provided herein.

## *Third Option of Identification for Registration of Elk*

A motion at the Sunday December 13, 1992 Executive Board meeting was passed which will allow members the option of using a eartag and a government issued tempered-.....as the 2 methods of permanent identification required for registration purposes.

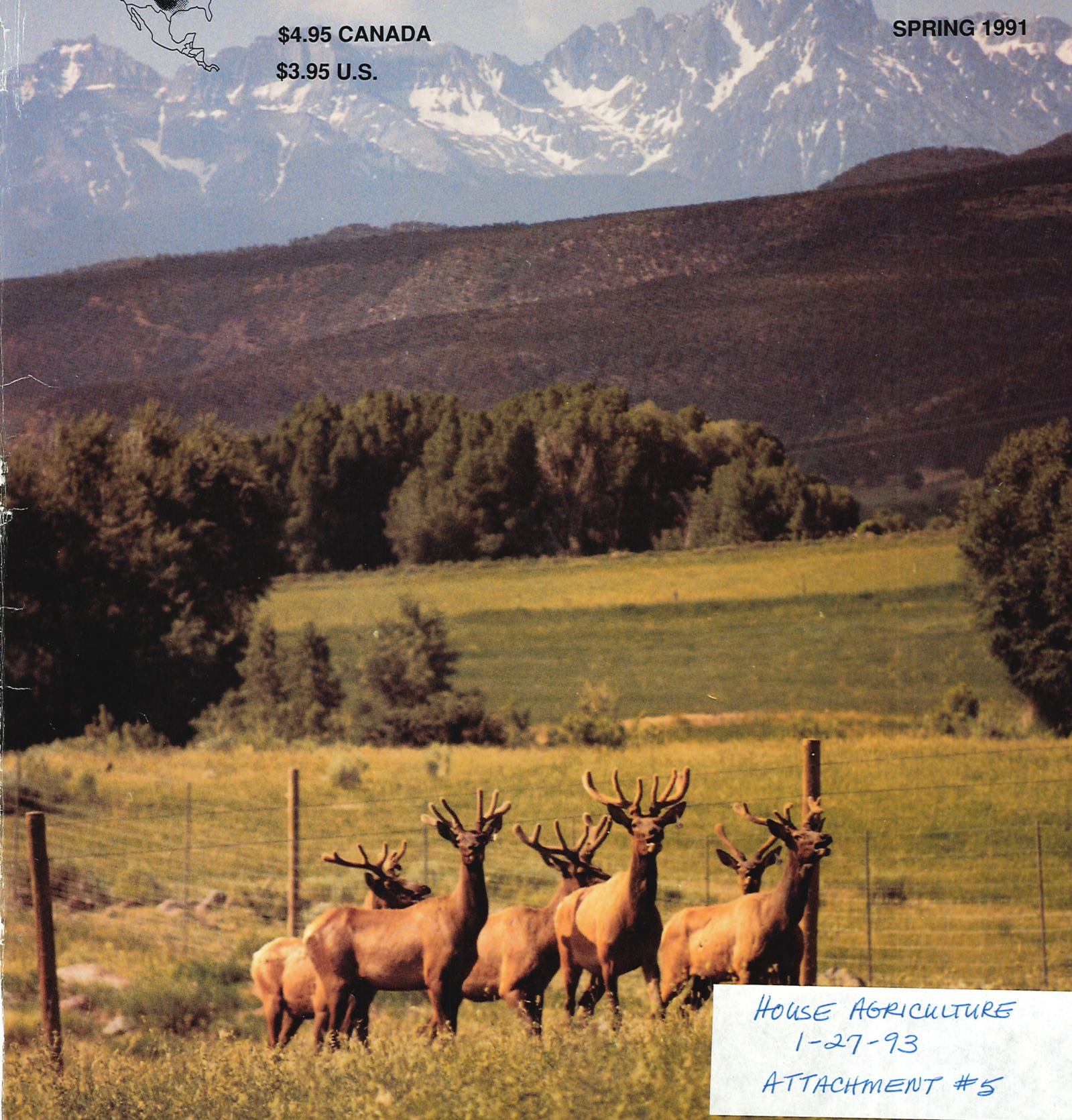
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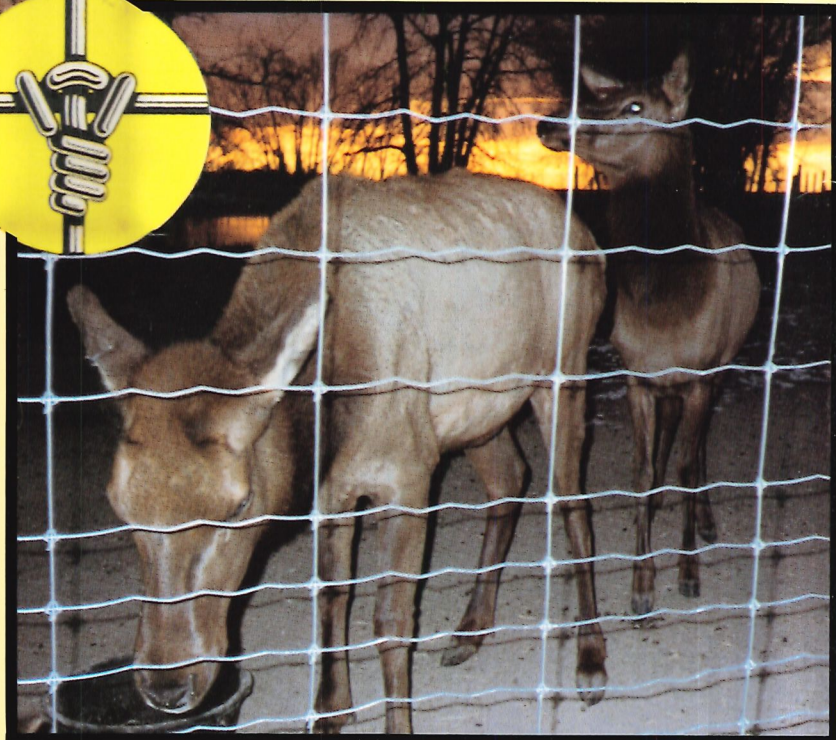
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5-2



# NORTH AMERICAN ELK

SPRING 1991

QUARTERLY JOURNAL OF THE NORTH AMERICAN ELK BREEDERS ASSOCIATION, INC.

VOLUME 1, NUMBER 3

Official Publication of the  
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The Quarterly Journal of N.A.E.B.A. serves as a forum to promote the elk ranching industry by educating the members and general public in proper management and breeding practices. It is the philosophy of this Association to share the fantastic rewards of its members with diversification from traditional agricultural operations through elk ranching as a futuristic and profitable industry.

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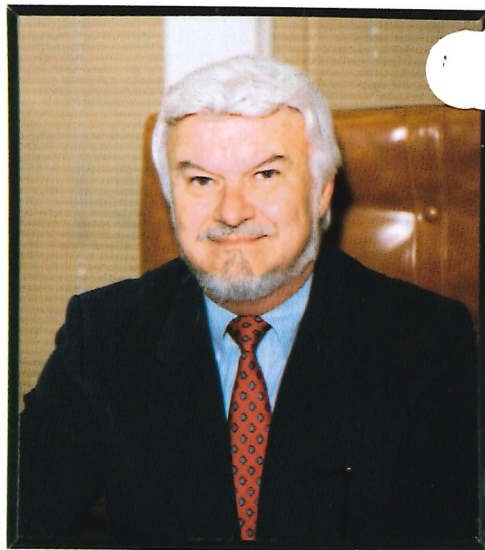
**ABOUT THE COVER:** This picture of Roger Prock's ranch in Montrose, Colorado demonstrates the true meaning of "Rocky Mountain Elk". Picture taken by Jerry Perkins of Olathe, Colorado.



Guess what!  
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in town!

5-3

# LETTER FROM THE PRESIDENT



Dear Member:

While preparing this message, I found myself reflecting upon the events comprising the first three months of this administration and was overwhelmed by the intensity of feelings which I had emassed on a multitude of subjects. Let me share these feelings with you.

First is the respect and appreciation that I feel for Rush Johnson, my predecessor, who has given so very much of himself to bring this association from merely a "gleam in the eye" to what we witnessed at the First Annual Convention in Kansas City. We thank you Rush, for a job well done.

Next is the awesome responsibility which we have accepted as this administration enters the next critical phase for our association, building a strong foundation for continued growth and vitality. This association has been operated, since its inception one year ago, by a 35 member Board of Directors. There was no initial provision for a direct vote of the membership since in the beginning there were no members. These Directors have operated this association "in trust" for the membership, making decisions that they felt were best, and giving unselfishly of their time, talents and money to keep the association safe and "nourish it" if you will, until it could stand on its own feet. Because of their efforts, that time has come, and by convention time next year, the control of the association will be turned over to the general membership. You, and each of you, will through your right to vote, inherit that awesome responsibility of which I have spoken, and will be responsible for the continued strength of our association and making it sensitive to our needs.

It is the avowed intention of this administration, and with the total support of the previous one, to build an association on a solid foundation with integrity as its cornerstone. All of our directors, without a single exception, are committed to build this association for the benefit of all of its members and promise never to allow it to become a tool of special interest groups.

It is with this dedication to commitment that we labor so that we can turn over to you, our members, an association that will not only fulfill your needs, but command your respect.

One of my duties as your President is to keep you informed of events affecting the association. On April 13, 1991 at a special meeting of the Board of Directors held in Moberly, Missouri, with all 35 Directors represented, the decision was made not to renew John R. Rice's contract as Executive Director. Our Directors are very familiar with Mr. Rice, having hired him initially, and having worked with him on a daily basis since the inception of our association. The association has grown, without question, during John's term of employment and we have found him to be a capable "energizer", however, a substantial majority of the Board felt that as we approached the next phase of growth, we needed a change of administrative personnel.

John Rice has informed us of his intention to pursue personal business activities, however, has assured us that he continues to support our association and will do nothing to compete against it. We wish him well.

We have advertised for a new Executive Director: In the interim we are continuing to provide full member services with the same office staff in our Durango location. We are blessed with a loyal, dedicated and highly qualified office staff whom, under the direct supervision of Miss Teena Hays, have administered our registration program, membership program, quarterly publications and convention preparation in the past and are continuing to do so, as is evident by this journal.

One of the major changes that you will immediately notice is the involvement of more people in the activities of the association. Committees representing major areas of interest in our industry and areas of concern to our association have been created and staffed. These committees are already working on tasks within their respective areas of influence. There will be specific activities in your area that will, from time to time, require your help and I assure you that you will be called upon for assistance. This association can not base continued growth on the energies of a select few, but must have the support and involvement of each of us if it is to flourish. We need your help, your ideas and your support!

God Bless You!  
Sam Withiam



## NORTH AMERICAN ELK BREEDERS ASSOCIATION, INC.

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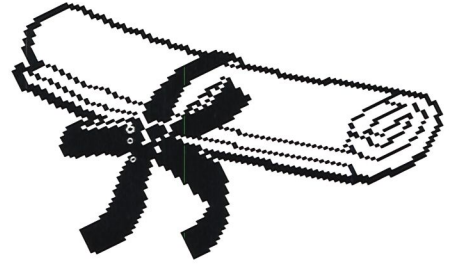
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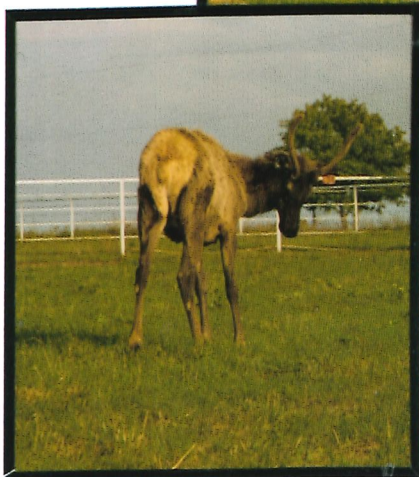
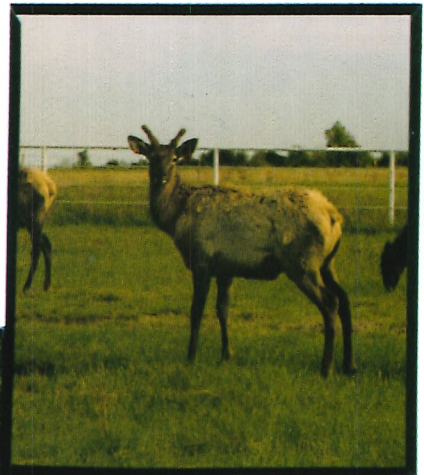
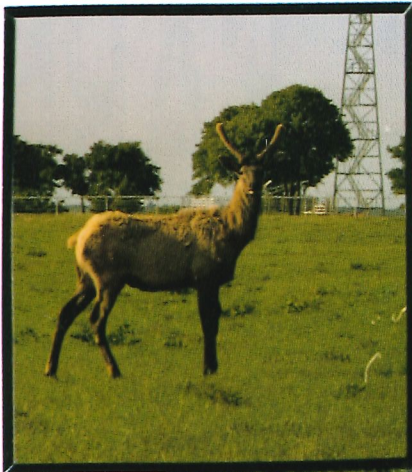
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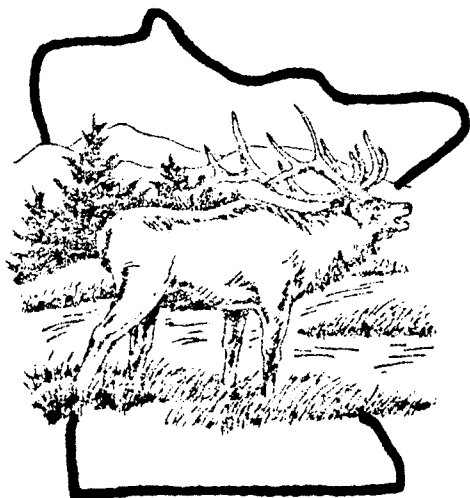
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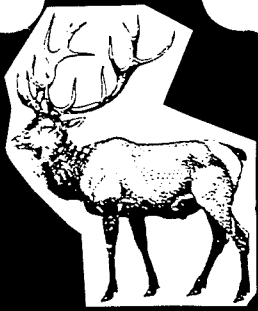
Phone (303) 669-3427 or (303) 667-0991

## ARTIST OF THE QUARTER... SARAH ROSE

Sarah started doing taxidermy at the age of 14 and continued her hobby for nine years, the last three of which she was employed by Mike Boyce of Reno, Nevada. She was very involved in taxidermy shows, winning two FNAWS gold awards for excellence in sheep shoulder mounts. She left taxidermy one year ago to further her wildlife sculpting career in Loveland, Colorado. She is currently completing her education by working in a foundry; a path that many young artists take to learn all the intricacies of bronze casting. The elk pictured at right was sculpted to represent the Nevada State record Rocky Mountain elk, scoring 386, and taken in 1977. If you are interested in Sarah's artwork, feel free to contact her at (303) 669-3427 or (303) 667-0991.

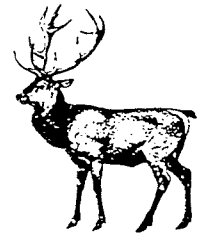
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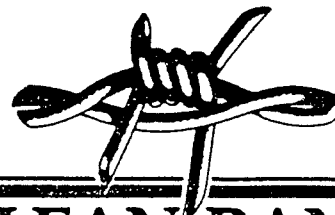


## DESCRIPTION OF PROPERTY

- 360 Total Acres, 160 Acres in warm season grasses (native), balance is improved pasture or wooded.
- The perimeter is fenced with an 8' high woven wire fence, plus a single strand of barbed wire at the top; primarily steel posts, with 6-8' wood post every 600' in concrete (4') plus all corners in concrete and braced.
- Highway frontage; approximately three-fourths of a mile on the east side of paved Highway FF, Farm to Market.
- 1 Acre lake with an all weather creek running through the property, two additional ponds, and all stocked with bass, blue gill and channel catfish.
- Property is stocked with approximately 25-30 American Elk, 25 very rare Pere David Deer and 12 Sicilian Donkeys.
- Two 25' tall observation towers.
- New animal corral and treatment compound constructed of 8' high woven wire; two 10'x20' wood frame sheds, with two stalls in each shed.
- Older 2 bedroom frame house; 2,407 square feet.
- A 2,190 square foot Log Home; the location of the log home is very private, located in the woods. The exterior is complete and interior is unfinished. Electricity and underground telephone are located at the home. The foundation is poured concrete with exterior log walls. The roof is of wood deck with cedar shakes. An open wooden porch extends across the entire front of the home (644 sq. ft.) and an open wooden porch (8'x30') is located at the back door. There are two native rock fireplaces, radiant heat, three bedrooms, two baths, three large closets, large living/kitchen (great room) approximately 1,000 square feet.
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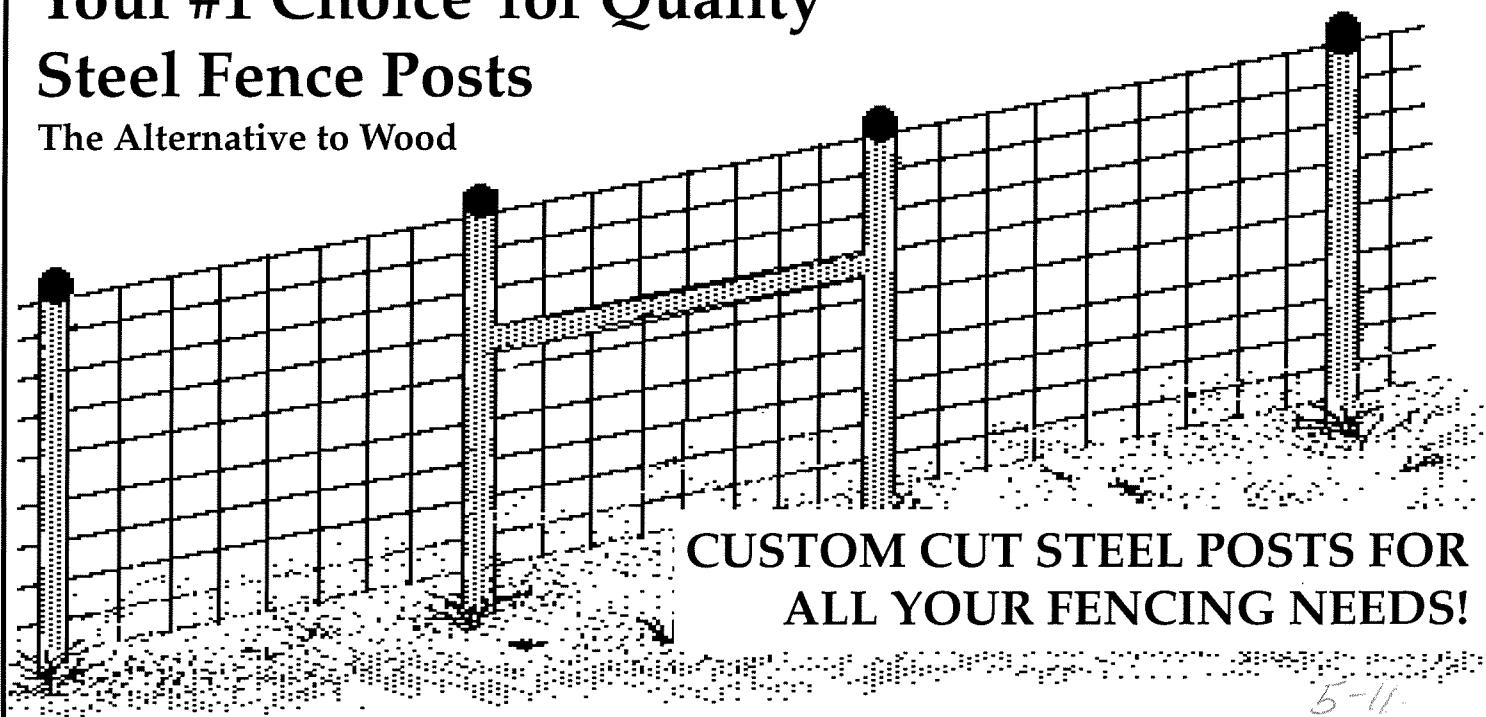
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5-11

# GENETIC TESTING OF ELK FOR PEDIGREE REGISTRY

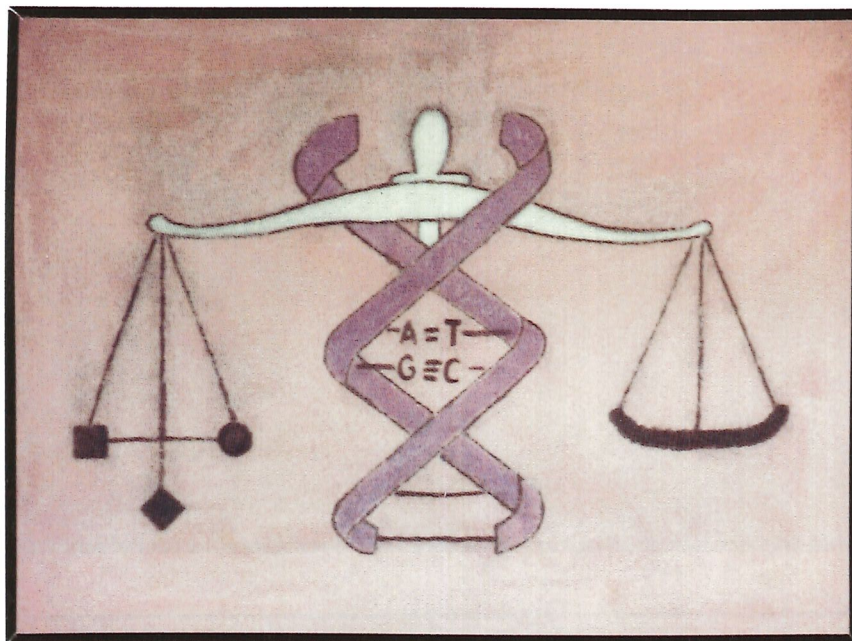
By: Clay Stern, Moses Schanfield and Shirley Miller  
Analytical Genetic Testing Center, Denver, Colorado

When John R. Rice, Executive Director of N.A.E.B.A., first approached us about the scientific parameters of testing elk for genetic markers, one of the goals of the North American Elk Breeders Association was to establish an elk/elk-hybrid registry. It was already apparent to us that the ranching of wildlife species was gaining popular acceptance in some circles, and was perhaps less desirable in others. It was the ethical approach for sound animal management that allowed us to rationalize that this association could successfully ranch elk, without ill effects

to native wild herds. The N.A.E.B.A. registry was to be based on reliable and sound pedigree records, and analytical data generated by an unbiased genetics laboratory.

Good record keeping of a herd's pedigree and performance can not be under stressed. The dairy industry's Dairy Herd Improvement (DHI) program is perhaps one of the best examples of what an industry-regulated herd management program can do for a breeder. Clearly, the dairy industry is a leader in livestock husbandry. Maintaining pedigree and performance records of an elk herd is really no different than that of a dairy herd. The successful elk breeder will keep records on individual animal's pedigree (parentage), vaccination dates, breeding success, calf birth weights, yearly antler characteristics, health records, and any additional information which the breeder feels is pertinent.

Appraisal of an individual animal for characteristics which a breeder finds desirable is largely based on physical and morphological traits that the breeder can see, and thus select for these traits. Intensive breeding with animals having desired traits will magnify the presence of those traits within a herd with each



passing generation. Of equal importance, a breeder may select against certain traits in order to remove or reduce the presence of these traits in the herd. For the elk breeder attempting to maintain or establish a herd of "pure" elk, it becomes important to know if any animals in the herd were derived from Eurasian red deer lineage. After several backcrosses of a red deer to "pure elk", it becomes increasingly difficult to detect the presence of physical red deer traits, and although an animal may appear to be a "pure elk", it may in fact be an elk-red deer hybrid. In these cases, genetic testing can be used as a tool to assist in herd management decisions.

Scientists and breeders alike are divided as to whether elk and red deer are the same or difference species, or subspecies of one another. In 1940, Mayr classically defined species as "groups of actually or potentially interbreeding natural populations, which are reproductively isolate from other such groups". The question then becomes whether elk *artificially* crossbred to red deer fit the biological concepts of the definition presented by Mayr, since red deer are not indigenous to North America. The issue of

elk and red deer speciation was born in the middle part of this century when taxonomists felt that a body of evidence was present to support debate of reclassification. It is not within the scope of this article to completely address or attempt to resolve this issue. However, it can be said that the designation of an animal as a "pure" elk or "pure" red deer is to a great extent an artificial determination, and often not a biological one.

If a hybrid animal is backcrossed to a "pure" elk, the offspring physically look more like elk with every passing generation. By the time an animal is considered 15/16 elk, essentially all physical characteristics of red deer morphology have been lost, yet logically, a 15/16 elk is still a hybrid. So, an issue to be addressed is, at what point is an animal functionally and operationally considered a "pure" elk? This is when genetic testing, such as that done in the N.A.E.B.A. registry process and genetic screening programs mandated by several states can be used to set guidelines as to when an animal is considered "pure" or "hybrid".

For any fault or complain genetic testing may have, in conjunction with good record keeping practices, it represents by far the most objective and powerful tool available for designation of an animal's status as "pure" or "hybrid".

As new genetic technology has been developed within the last decade, genetic testing to the layman has come to be synonymous to DNA analysis. DNA is the individual-specific genetic coding material of every living being. An individual's genes are made up of DNA; it is the genes which then code for various proteins (gene products). DNA analysis is gaining rapid acceptance for use in parentage and pedigree testing, however; if the analysis of the gene products which are currently used to differentiate racial or population variations such as those seen in elk and red deer.

## Why do genetic testing?

Genetic testing provides an unbiased source of information to assist in the verification of an animal's pedigree. Often, this testing is forced to stand alone as the only

source of data to validate the "purity" of an animal. This is not a scientific mandate, but rather a political or social-economic one. Genetic testing can be and should be used as a tool to aid the breeder in the verification and selection of animals of desired pedigree.

Second, several states, such as Colorado, Wyoming, and Idaho, have passed or are in the reviewing process of passing legislation regarding the possession and commerce of cervids (referring to members of the deer family) within their borders. This legislation mandates the use of genetic analysis of elk to verify the "genetic purity" of individual animals to assure that red deer genetics are not accidentally introduced to resident wild elk herds.

Third, genetic testing by an independent laboratory adds credibility to the breeder and the breeding association by virtue of objective scientific evaluation.

### How is genetic testing done?

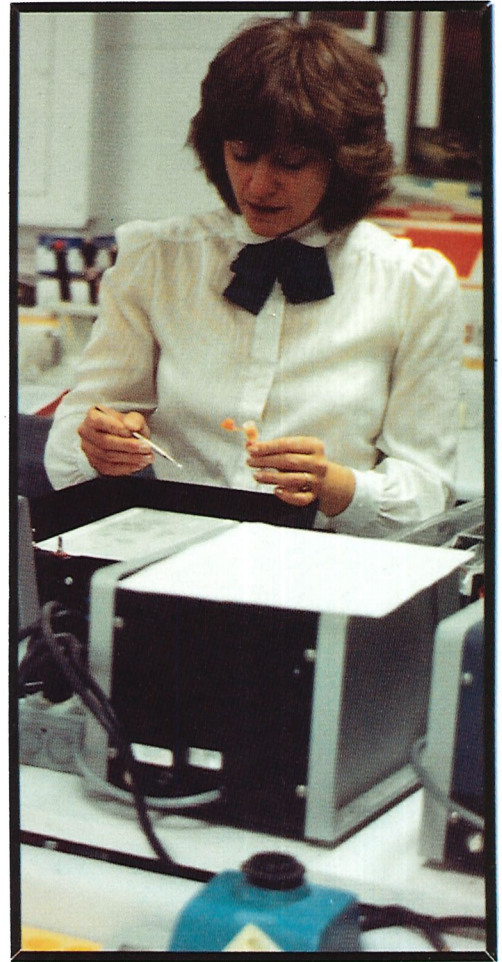
There are many techniques used in human genetic analysis. Many of these techniques are not applicable to cervid genetics due to lack of available antisera or other reagents. The techniques of electrophoresis are most widely used in cervid genetic testing.

Electrophoresis is a method of separating molecules with minor differences in their net charge on a gel matrix similar to Knox gelatin. Conventional electrophoresis has proven useful in isolating and differentiating many allelic systems. Another type of electro-

phoresis is isoelectric focusing electrophoresis (IEF), which can be historically traced back to 1912. IEF has evolved greatly since 1912, and dramatically changed since the late 1970's. Separation of molecules by IEF is based on variation in a molecule's net electrical charge and its relative acidity or alkalinity. The major advantage of IEF over conventional electrophoresis is its ability to separate gene products with better resolution and permits the identification of previously unknown variants.

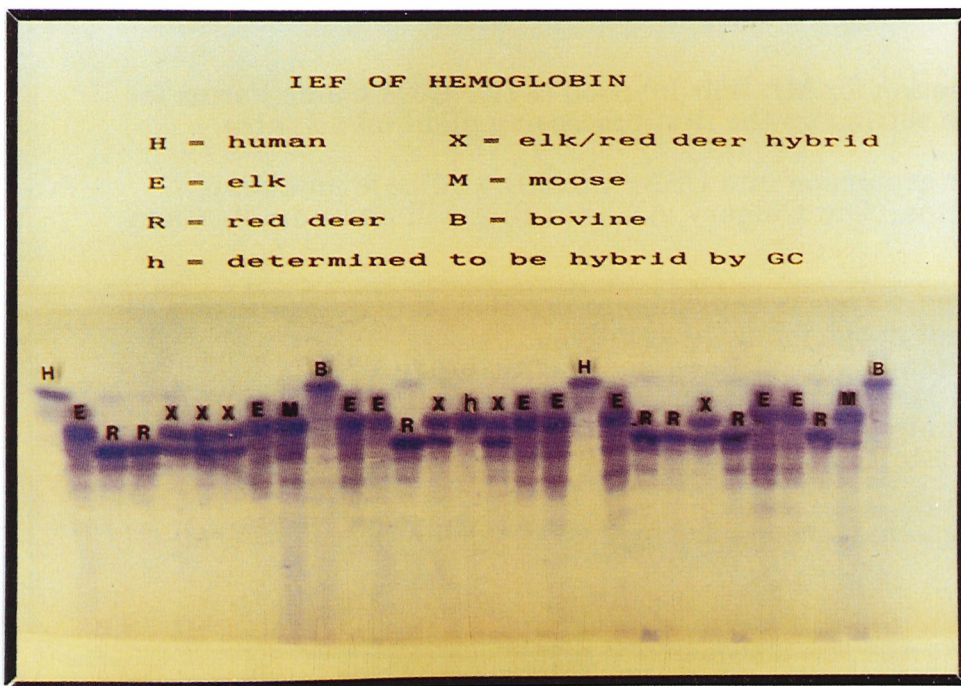
When analyzing several of the elk genes, the technique of western blotting is implemented to further enhance IEF sensitivity and specificity. Western blotting involves the transferring and fixing the gene products from the electrophoretic gel to a nylon membrane, and detection of the gene products using highly purified and specific reagents which selectively bind to the gene products of interest. The gene products are then visualized using enzyme mediated color reactions. The nature of western blotting adds a level of sensitivity and specificity unobtainable by standard staining methods.

An example of the use electrophoresis for detection of genetic markers is the analysis of hemoglobin, an oxygen transport molecule of blood. When blood samples of elk and red deer are placed adjacent to each other on an electrophoretic gel and an electrical current is then applied to the gel the hemoglobin of the red deer will migrate faster than that of the elk. Once the hemoglobin of an animal has been electrophoresed, it forms a tight band in a



specific area of the electrophoresis gel. This band represents the expression of the hemoglobin gene of that animal. Therefore, if the animal is a "pure" elk it can only express the elk hemoglobin gene, it can never express the red deer gene. Conversely, a "pure" red deer can only express the red deer hemoglobin gene. But if a "pure" elk is crossed with a "pure" red deer, then all of the F<sub>1</sub> offspring will express both elk and red deer hemoglobin genes.

Again using only the hemoglobin gene as a genetic marker, if a F<sub>1</sub> hybrid were crossed to a "pure" elk, statistically half of the offspring will express both the elk and red deer hemoglobin genes, while the other half will only express the "pure" elk gene. This phenomenon occurs because any expressed gene is actually made of two alleles, one donated by each parent in a random fashion. Statistically half of the hybrid offspring of a backcross mating would be classified as a "pure" elk, when in reality they were derived from red deer lineage. This problem is circumvented by the analysis of additional gene products



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**Mr. H.J. Im, Chief Technician, Canada**  
**Mr. Y.H. Kim, Chief Technician, U.S.A.**

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(815) 247-8845

in conjunction with **Hardrock Game Farms** serving all elk farmers in this region.

**We** deeply express our appreciation for Mr. Bob Johnson of Hardrock Game Farms for his help and contribution in setting up the first processing plant on his farm.

**We** are please to announce our expansion into USA. Our head office is now being opened in Seattle, Washington. Our Calgary, Alberta office will maintain its Canadian operations.

**We** are pleased to announce that we are now in the process of setting up processing plants under the new concept at the following locations:

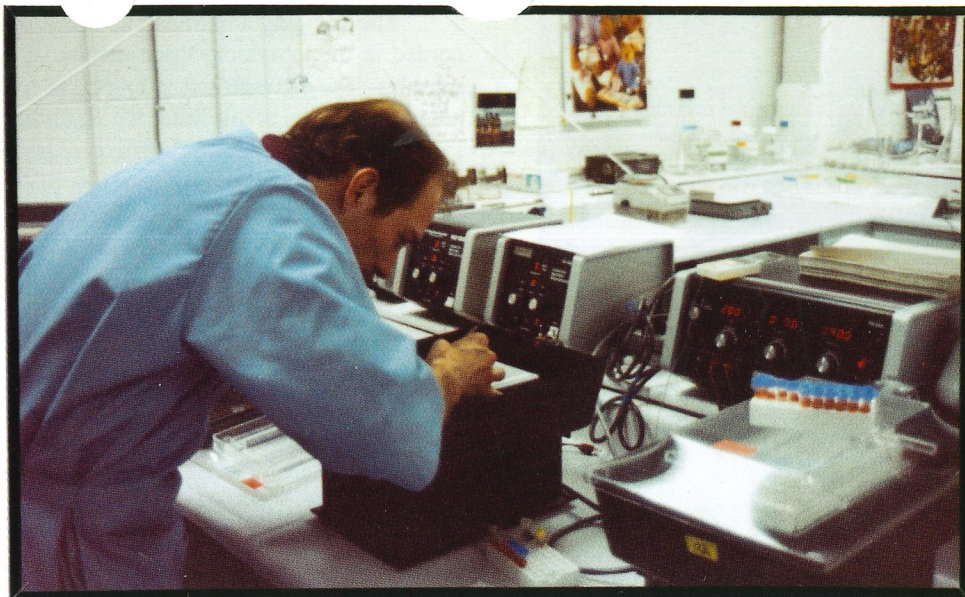
Mid Colorado	Central Alberta
Central Missouri	Central Ontario
Eastern Montana	Western Saskatchewan

\*Addresses and phone numbers will be published in the next N.A.E.B.A. issue or contact our Calgary office.

**We** will work with you to bring game farmers the highest possible prices for velvet.

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such as GC or C3. Again, good breeding records can be useful in identifying hybrid animals.

### *What type of genetic testing is done?*

There are several tests available which can distinguish elk from red deer. These tests are 1) hemoglobin, 2) post-transferrin (Ptf), 3) GC, and 4) C3. All of these tests are done using electrophoretic techniques. Hemoglobin variation between elk and red deer was described by Dratch in 1983 using IEF.

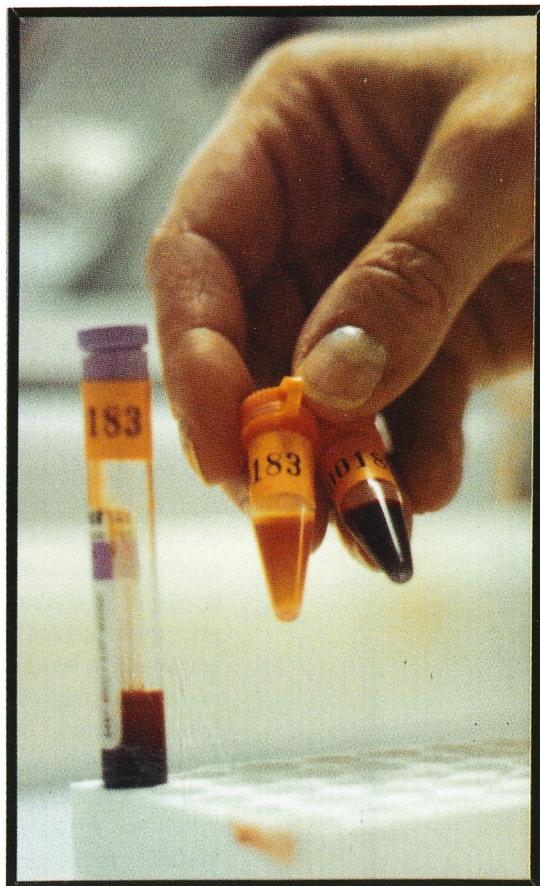
The function of post-transferrin is not clearly understood. Elk and red deer express different electrophoretic patterns of post-transferrin, with hybrid animals expressing a combination pattern of the two parents' patterns.

Highly conserved in mammals, GC (group specific component), is a vitamin D transport molecule of blood. GC in

elk and red deer displays several different phenotypes (polymorphisms) which are maintained within the population and are not a result of recurrent genetic mutations. To date, our laboratory has identified 4 of these polymorphisms (allelic variants) of GC in elk, and two variants associated with red deer. There is no data to suggest that any single GC phenotype is superior in function or animal survival

ability than any other GC phenotype, nor is it likely one will be demonstrated in the near future. With the cooperation of several members of N.A.E.B.A., we have established that GC alleles are inherited in a simple, straight forward fashion. Therefore, the allelic polymorphism seen in GC may make it useful as part of a paternity testing program.

Transferrin and SOD (superoxide dismutase) are



and the laboratories. Although transferrin and SOD analysis may offer some useful information, they lack the relative power of discrimination of hemoglobin, Ptf, GC, and perhaps of C3.

### *The N.A.E.B.A. Laboratory*

N.A.E.B.A. contracts with the Analytical Genetic Testing Center, Inc., (AGTC) of Denver, Colorado to provide the unbiased application of genetic technology for pedigree analysis as part of the N.A.E.B.A. elk registry process. AGTC is a full service forensic and paternity testing laboratory, not affiliated with any state wildlife or agricultural agency, or any organization associated with the direct sales of animals.

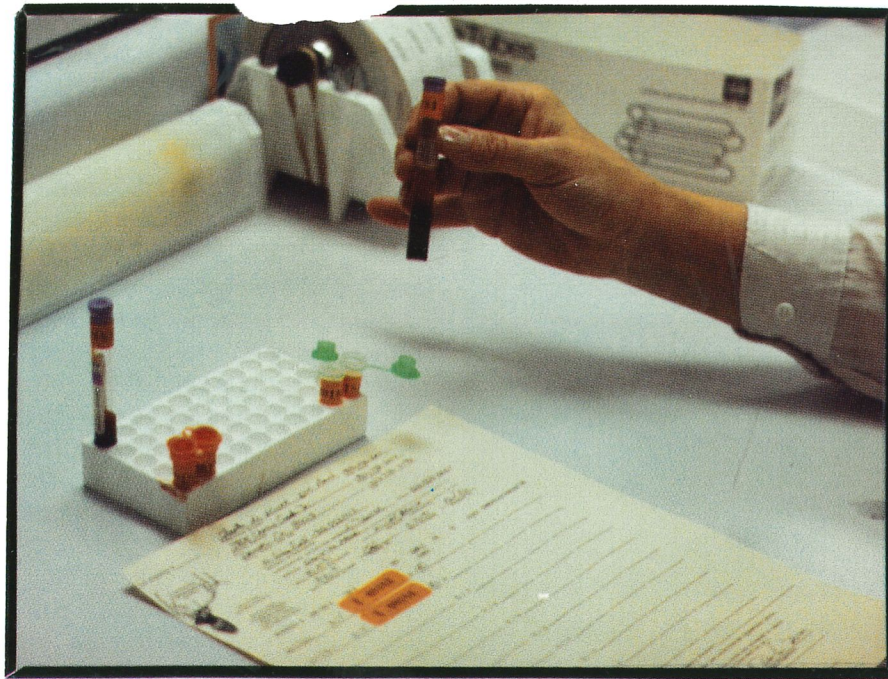
The AGTC staff involved with elk genetic testing represents an integrated and multidisciplinary group of scientists with backgrounds in population genetics, clinical and research diagnostics, and wildlife biology. Leading this team is Dr. Moses Schanfield, a well respected population geneticist with over 20 years experience in the genetics field, and author or co-author of numerous professional papers and book chapters. Dr. Schanfield also routinely serves as a court appointed expert witness in the areas of genetic testing. Shirley Miller is AGTC's supervisor of DNA and Electrophoresis, and is the co-developer of the C3, and GC techniques used for elk testing at AGTC. Shirley is widely respected by her scientific peers for her ability in the areas of electrophoresis and paternity testing. The resident wildlife biologist at AGTC is this article's first author, spending most of his time during his Master's candidacy applying DNA technologies to the individualization of elk, techniques AGTC will be using for paternity testing in the near future.

### *Testing your animals*

The importance of the proper collection of a blood sample for genetic testing can not be under emphasized. Within each blood collection kit received from the N.A.E.B.A. office is a set of directions regarding collection and transport of your samples. It is critical that these directions are followed to assure that documentation at the N.A.E.B.A. office coincides with your animal's identification, microchip, blood tube number, and documentation retained at the laboratory.

Each blood tube in the collection kit contains a preservative, which prevents the blood from clotting in the tube. Immediately

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after drawing the blood into the tube, mix the tube by gently inverting it several times. If it is not possible to send blood samples to the lab the day of collection, you should store the blood in the refrigerator until they can be sent. Samples stored in this way are stable for several days. Avoid allowing the samples to freeze.

The age of the animal at the time of collection is not critical. The genetic markers used in pedigree and paternity testing are fixed in the individual prior to birth therefore, samples collected from a newborn calf are as valid as those from any adult animal.

In addition to testing your animals for registry reasons, it is often required to have testing done as contingency of sale or interstate transport. We would advise the breeders

to submit blood samples for analysis 3 weeks prior to the date of the transaction. This gives the laboratory adequate time to repeat tests if necessary, and the N.A.E.B.A. office time to review and issue any necessary registry information.

Once the blood is received in the laboratory, it is handled as if it were a piece of evidence in any legal matter. The chain of custody of a blood sample starts with the breeder and veterinarian collecting the samples and verifying it's source. Chain of custody maintains the legal integrity of the samples. All of the information on the genetic testing request form are part of the chain of custody, so it is extremely important that sample packing and shipping information is filled in and that the form is signed by both the veterinarian

and breeder.

The shipping and transport data are recorded in the laboratory upon receipt of the samples. The package and sample conditions are also recorded at this time. The individual samples are then separated into three parts, 1) plasma (the liquid phase of blood) for plasma protein analysis, 2) packed red blood cells used for hemoglobin analysis, and 3) white blood cells, which are washed, then lysed and stored for future DNA testing.

Blood samples are routinely analyzed for hemoglobin and GC. Using either of these tests individually, all of the elk-red deer  $F_1$  hybrids will be detected. If an animal is the offspring from intensive breeding of backcrosses, the power of discrimination of hybrids drops. This is not a fault of the tests. If hybrid genes for hemoglobin or GC are present they will be detected. However, by the nature of backcross breeding, these genes may not have been inherited by the offspring and are therefore not present. This brings back to the issue of when can a backcrossed animal be considered "pure".

After testing is completed, each result of every animal must be independently reviewed by 2 qualified lab personnel, and is often reviewed by 3 individuals. If there are any discrepancies in the interpretation of a result, that sample must be retested. The results then are reviewed again by the laboratory director for clarity, or discrepancies which may have occurred during data transcription. Results are then faxed to the N.A.E.B.A. office. The original genetic testing request is sent to the N.A.E.B.A. office who has custodial duty of the document. Information on this form is used to generate and issue registry certificates, so again information on this form must be accurate and complete.

The registry procedure, although simple in appearance, is an essential and highly integrated process involving the breeder, the N.A.E.B.A. staff and a genetics laboratory. It is a significant first step towards developing an industry-regulated breeding program to facilitate the goals of the association. The detection of backcrossed hybrids becomes less of an issue by increasing the number of gene products analyzed. Therefore, new test systems need to be continuously researched and evaluated to increase our ability to detect hybrid genetics.

New techniques of identification of species and paternity testing of cervids are being developed in our laboratory which will be available in the near future, perhaps prior to circulation of the next N.A.E.B.A. quarterly journal.

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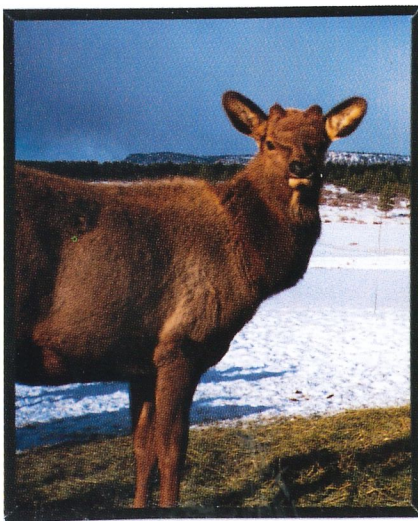
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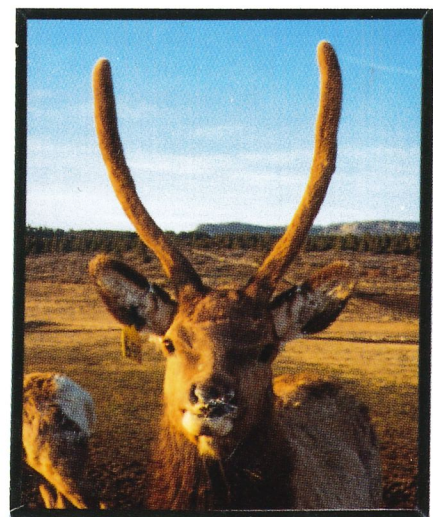


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RAY AND JEAN, PROPRIETORS



For the past eleven years we have been using selective breeding to come up with some extraordinary elk bulls. In the Fall of 1990, three of our bulls were harvested and officially scored by Boone and Crockett and Safari Club International scoring systems.

		<u>B.C.</u>	<u>S.C.I.</u>
8 - year old bull	8 X 8	421 2/8	343
6-year old bull	7 X 10	405 5/8	360 6/8
6-year old bull	7 X 7	402 7/8	338 4/8
<u>Unofficial scoring of shed rack for 1990 of our lead bull</u>			
7-year old bull	8 X 8	381 4/8	346 2/8

- In the record books these animals would rank as high as third in both scoring systems •
- We cut 26.8 pounds of Grade A velvet off a four year old bull •
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# A DISCUSSION ON ELK NUTRITION

By: Sharyon L. Doshier  
Manager, Timberline Ranch, Ltd.

**A**t Timberline Ranch we are constantly striving to achieve our goal of breeding and raising "super elk". We are convinced that nutrition is the key to achieving that goal. It is our opinion that an elk that may be genetically average can equal or even outperform an elk from the most royal bloodlines if the elk is maintained on a higher nutritional plane that will allow him to express his full genetic potential. Nutrition affects all the areas that we are concerned with as elk raisers, although elk are extremely resilient animals and can survive on marginal diets, body growth, reproductive success and velvet production will all suffer dramatically.

In our industry today we have operations that vary from those that run hundreds of animals on thousands of acres to those that may have 3 elk that are kept in small enclosures. There are some producers that turn their animals out, provide minimum supplemental feeding, and handle their animals as little as possible. Other producers may practice a more labor intensive program and bring their animals in for weighing and routine treatment, hand feed their animals every day and use a more complicated feed ration. There is no magic ration that will work for every operation. In this article I will attempt to present you with the basic nutritional needs of elk and provide you with tools to enable you to meet these needs, giving your animals the opportunity to achieve their optimum potential regardless of whether your goal is to grow the biggest velvet bulls, have the most productive cow herd, raise a superior meat animal or to have the top selling animals at the next auction. Remember, the basis for achieving any of these goals is optimum nutrition for each animal - if you ignore nutrition, nothing else will fall into place.

Every operation is different and has unique factors that must be taken into account in the development of your nutritional plan.

Soil composition, available forage, economic factors and availability of feedstuffs will vary from one area of the country to another. The operational goals (cow/calf, velvet, meat) as well as the amount of time that you want to spend on maintaining your animals must also be taken into consideration. Weather conditions and available working facilities also need to be factored into the equation.

Step #1: *EVALUATE* what you do have available (take soil and forage samples so that you know exactly what you have been providing for the animals).

Step #2: *SET DEFINITE GOALS* (target weights, production targets).

Step #3: *DETERMINE ANY DEFICIENCIES* in your present program that can be corrected by supplemental feeding (check the results of the samples you take against the recommended nutritional requirements chart).

Step #4: *FORMULATE A FEEDING PLAN* that will allow you to reach your goals using feed items that are the most economical and readily available in your area.

*Why Supplement Feed?* Ruminants can only consume 2.5% of their total body weight in dry matter per day. Elk have 12-13 hours a day grazing time, (the remaining time allotted to rest, travel, cud chewing, etc.) The average cow can be expected to take in 11 lbs. of dry matter per day on good natural pasture as compared to 15 lbs. per day on alfalfa pasture and 8 lbs. per day in poor or stemmy pastures. It is impossible for her to meet her dietary maintenance needs for forage alone in 8 lbs. a day, not even taking into account her mineral/vitamin or energy requirements. If good pasture is not available a supplement must be fed just to maintain elk at their current level.

In addition to assuring that all animals dietary requirements are being met, supplementary feeding can be used as the tool to increase the carrying capacity of the operation without having to purchase more acreage, to correct deficiencies in the diet, and as a tool in behavior control and correction. Elk can be trained, by the use of feed, to move quietly through your facility, to move from one pas-

ture to another, and to become accustomed to people without becoming frightened.

*What To Feed?* Elk are probably the most versatile animal in terms of what they will eat and the ability to adapt their diets very quickly to what is available. Elk are thriving on a diversity of feedstuffs all over the U.S. and Canada. Alfalfa and grasses are the most common basic supplement along with oats, corn (shell corn, cracked corn, corn husks, ears and stalks) barley, wheat, soybean products, potatoes, beet pulp, acorns, turnips, chopped vegetable matter, brewery waste products, aspen bark, silage, straw and nitrogen treated straw, commercially prepared cattle feeds and a variety of pelleted feeds. If your animals will eat it, it meets their dietary needs, it is readily available, easy to handle and economically obtained in your area, by all means feed it - take advantage of this wonderful versatility that elk have in regard to diet.

Nature has equipped the elk with one of the most efficient digestive systems. The rumen of the elk is able to synthesize protein from nitrogen which results in a higher protein content than the originally digested food. Protein is needed for the development of new cells for body maintenance, growth, reproduction and lactation. Crude protein requirements for cows will range from 10% for maintenance up to 18% during peak lactation, in bull 10% for maintenance to 16% during velvet growth and in calves 10% for maintenance up to 18% for optimum growth.

The rumen also synthesizes water soluble vitamins such as the B complexes and C. Fat based vitamins, such as A, D, E and K must be supplied in the feed. Vitamin A requirements are from 2,000 - 5,000 IU/kg, Vitamin D 500 - 1,000 IU/kg and Vitamin E 30 - 45 IU/kg.

Energy requirements of elk are very important, elk on low energy diets do not attain maximum size and weight. Protein levels become important for optimal development only after energy requirements are met - if choosing between protein or energy requirements are met - if choosing between protein or

energy. Apply energy needs to energy requirements for cow maintenance is 2.3 to 2.8 during peak lactation, for bulls 2.3 to 2.4 and calves 2.3 to 3.0. Corn is the best energy source followed by oats, alfalfa, barley, wheat and silage.

The principal minerals we are concerned with in elk rations are calcium (.35 - .7%), Phosphorus (.25 - .7%), Magnesium, (.2 - .7%), Potassium (.75 - 1.0%), Salt (.1 - .2%), Iron (50 - 75 ppm), Copper (120 - 20 ppm), Maganese (40 - 50 ppm), Zinc (50 ppm), Iodine (.3 - .5 ppm), Cobalt (.1 - .2 ppm) and Selenium (.2 - .3 ppm). Minerals are vital for skeletal formation and maintenance, protein synthesis, energy utilization, oxygen transport, fluid balance and muscle function. Although all minerals are essential, elk seem to be unusually susceptible to copper deficiencies. The magnitude of the copper problem prohibits an in-depth discussion in this article and should be addressed in a separate article.

*When To Feed?* Nutritional needs of elk vary in relation to age, sex and intended use (i.e. calf, pregnant cow, lactating cow, velvet bull, breeding bull, etc.), however, all elk have one common critical feeding time, that being in the fall when they are developing their kidney fat capsule - this can not be developed

at any other time of the year. Most domestic farm animals have lost this yearly cycle of building and using fat reserves, however, elk have not yet adapted to ignore this natural cycle. Only a good fat reserve will enable an animal to survive severe winter conditions when its metabolism converts to fat-burning. This cycle is maintained in elk even after years of living in enclosures and under optimum feeding conditions. Lack of feed in the autumn cannot be compensated for even by optimum feeding conditions during the winter months!

Visual assessment and periodic weighing are the other methods you will use to determine when supplementary feeding of certain individuals is needed. Our eyes are our most important tool - look at your animals daily to assess their general overall health, coat condition, fitness level and well-being. If they are losing weight or appear listless, something needs to be done immediately to correct the situation. Visual assessment alone can be very deceiving in the winter - elk may appear plump because of their heavy winter coats and the fact that the hair has a tendency to stand on end to hold in body heat, or they may have nice large, round bellies that are filled with very low quality feedstuffs that

aren't doing them any good. Malnourished animals in the wild often have a sufficient quantity to eat but the nutritional quality is not adequate as opposed to starvation situations where both quantity and quality are not available. The best defense is to feed a balanced diet and to weigh your animals periodically during the winter to monitor weight changes, then feed according to your findings. We weigh our calves every 45 days and our adults twice during the winter to monitor weight fluctuations.

*Who To Feed?* At Timberline Ranch we have divided our nutritional program into three groups:

1) *CALVES* - males and females weaning age to 15 months. Our calf ration is formulated for maximum growth and development. All calves are feed this ration from the time they are weaned, shortly before rut, to 15 months of age.

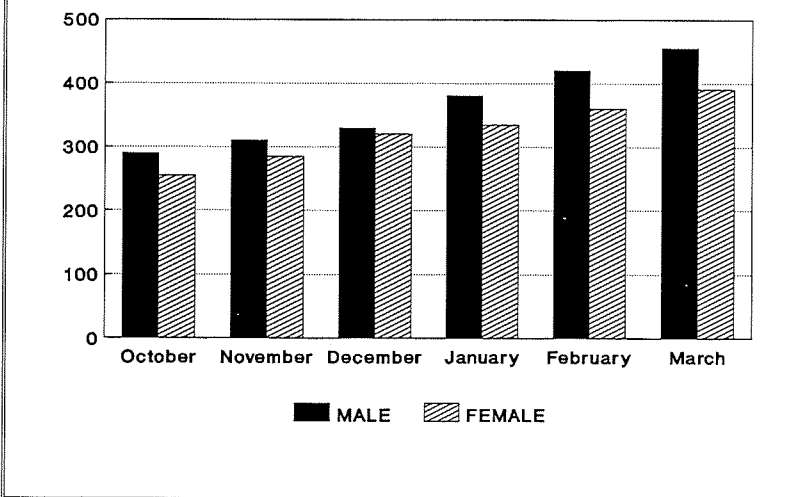
2) *COWS* - all mature females over 15 months. Our cows are on a maintenance ration from November to March, gradually increasing in April and May up to their highest ration levels for lactation demands in June, July and August, then put on a ration formulated for breeding in September and October.

3) *BULLS* - all mature males over 15 months. Bulls are fed a ration formulated for optimum velvet growth from February thru June and are on a maintenance diet at all other times with the exception of breeding bulls which are briefly put on a high carbohydrate diet after rut until they have gained back to within 10% of their pre-rut weights.

#### *FEEDING COWS:*

Breeding females need to be in good flesh and on a slightly rising plane of nutrition going into rut for maximum reproductive success. At Timberline Ranch, we have set target weights of 560 lbs. to 650 lbs. for mature cows going into the breeding season (studies show that at 560 lbs. conception rates of better than 90% can be expected) and target weights for yearling heifers pre-rut at 450 lbs. to 550 lbs. (studies show a better than 60% conception rate to be expected at over 450 lbs.) We have had very good results in breeding

## 1990 CALF WEIGHTS TIMBERLINE RANCH, LTD



18 months. Heifers that meet the weight targets, we weight all females prior to rut and put everyone over 450 lbs. with a bull regardless of age.

Studies show that if a calf weighs more than 36 lbs. at birth it has a 90% chance of survival. If a cow loses more than 3% of her maintenance level total body weight during gestation, her calf will weigh less than 35 lbs. at birth resulting in a chance of survival below 90%. If a cow should lose more than 3.6% of maintenance total body weight during gestation her calf will weigh less than 25 lbs. at birth and have less than a 45% chance of survival. Losses of over 10% of maintenance total body weight during gestation have been found to cause embryonic or fetal death leading to resorption, abortion or stillborn calves. As little as a 2.6% loss in body weight may effect milk production and result in a calf that does not reach its full potential.

Protein demands of pregnancy increase slightly over maintenance levels of 10% near the 100 day of gestation (December 25th) to 14%, increase measurably by day 215 (April 15th) to 16% and reach 18% at parturition (appx. June 1st) and remain at that level during lactation. Energy requirements follow this same general curve.

At Timberline Ranch we meet our cows requirements by giving them free-choice alfalfa at all times and using our special formulated pellet (see analyses in Block A) as the basic supplement in our ration. These pellets are fed each day in raised feeders in amounts ranging from 2 lbs. per head for maintenance levels up to 6 lbs. per head during lactation. Under conditions when animals are under stress, need additional weight gain or general conditioning during severe weather, whole shell corn is added at a rate of 1 - 2 lbs. per day. Since the pellet supplies all the vitamin and mineral requirements as well, no salt, vitamin or mineral range blocks are put out (we have found that the majority of elk will not utilize salt or mineral blocks anyway.)

**FEEDING BULLS:** Body maintenance and growth takes precedence over antler growth. Much of the nutritional intake for a

bull from weaning age to 18 months is utilized for basic body needs and growth. With each successive year as the bulls body growth slows, more and more of the nutritional intake is available for antler development since nutritional intake formerly being used for development can now be used for velvet production. Much of a bull's velvet producing potential is derived from genetics, however, without optimum diet a particular animal will never live up to his full genetic potential. There is a general correlation between body weight and antler growth - usually the more body weight of the animal, the more velvet is produced - however, there are exceptions to every rule.

We have established target weights of 800 lbs. to 1,100 lbs. for mature bulls at velvetting in June and 500 lbs. for yearling bulls at that same time.

Studies have shown that in feeding for velvet production, the only time that it is economically feasible in terms of dollars spent to velvet monies returned, is to supplement when the velvet is actually growing. Using as an example a bull that will grow 30.8 lbs. of velvet during a 140 day period, from day 1 of antler growth to day 70, he will grow 8.8 lbs. of velvet and will need 2.52 oz. of calcium and

1.12 oz. of phosphorus per day just to meet his maintenance requirements and replace what he is putting into the velvet. From day 70 to day 140 he will grow 22 lbs. of velvet and need 1.6 oz. of calcium and .05 oz. phosphorus to meet maintenance and velvet growth needs.

At Timberline Ranch we feed our bulls free choice alfalfa round bales at all time and our pellet at a rate of 2.5 lbs. per head for maintenance up to 4 lbs. a day during velvet growth. During velvet growth, they get an additional 1.5 lbs. of a commercially prepared cattle sweet feed that has soybean meal and diacalcium phosphate mixed in it to disguise the taste. We feed our breeding bulls recovering from rut a ration of 5 lbs. pellets and 1.5 lbs. corn per day until they regain to within 10% of their pre-rut weight.

**FEEDING CALVES:** We feed and manage our calves extensively from the time we wean them prior to rut in September until they reach 15 months of age. We feed them the best that is available to meet or exceed all their dietary requirements. We have been able to increase our calf weights and body size substantially each year for the past 4 calf crops. We weight our calves once a month to be sure that we are achieving our target weights

TIMBERLINE RANCH, LTD.		
Custom Pellet Analysis		
Digestable Energy	4.0	(Mcal/kg)
Crude Protein	18	%
Min/Max Acid Detergetn Fiber	20/45	
Min/Max Neutral Detergetn Fib.	25/50	
Fat	4.0	
Calcium	1.5	
Phosphorus	.6	
Magnesium	.4	
Potassium	1.0	
Salt	.2	
Chlorine	.3	
Sulphur	.3	
Iron	75	ppm
Copper	30	
Maganese	85	
Zinc	95	
Iodine	1.0	
Cobalt	.3	
Selenium	.4	
Vitamin A	5600	(IU/kg)
Vitamin E	50	

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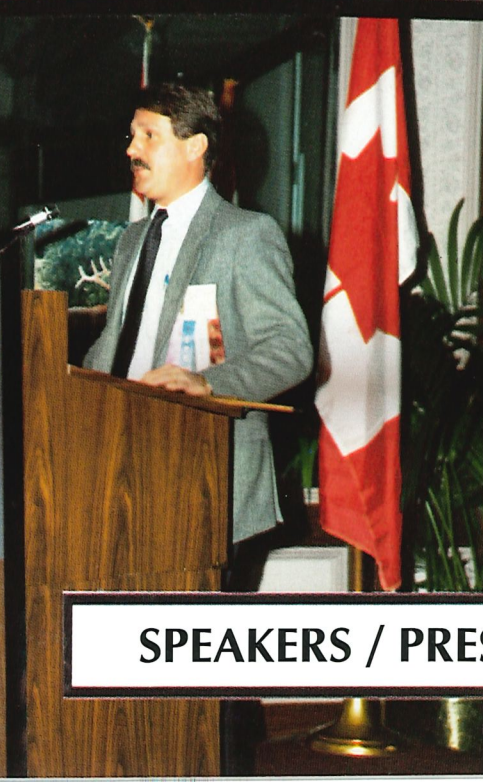
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**From the staff at N.A.E.B.A.**

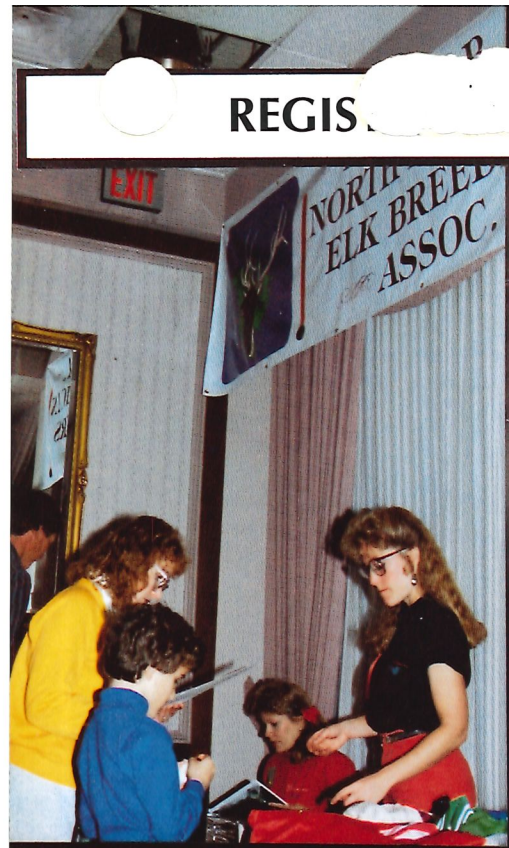




**SPEAKERS / PRESENTATIONS**

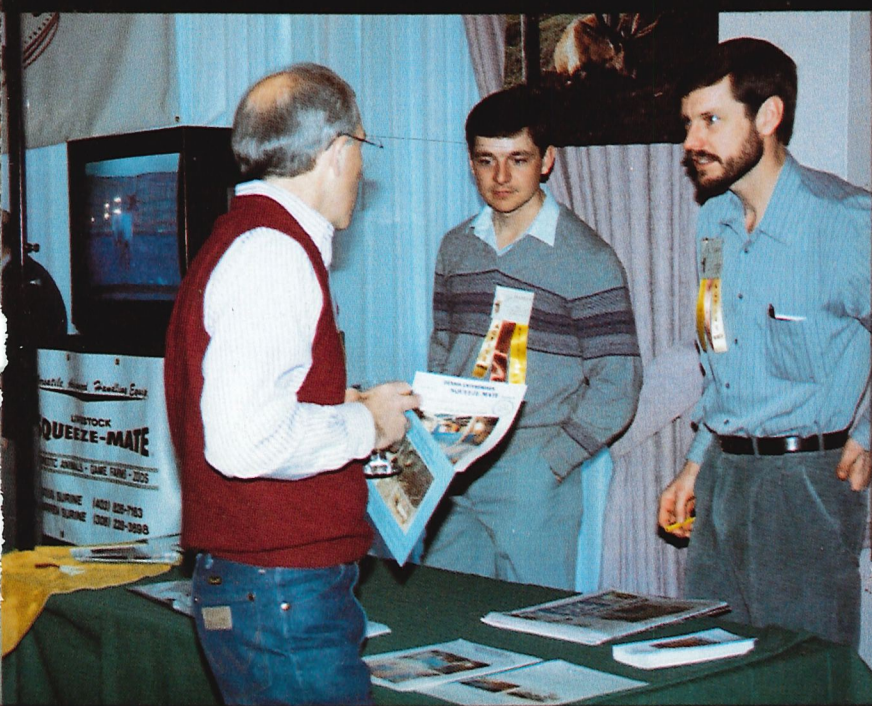
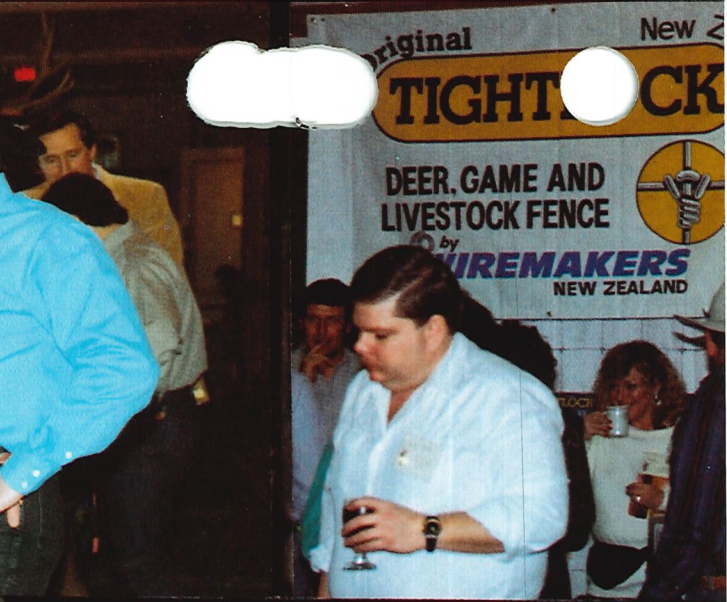
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# REGISTRATION



# EXHIBITORS





**EXHIBITORS**





**OPENING CEREMONY**





**LADIES' LUNCHEON**





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# DINNER CRUISE





**DINNER CRUISE**

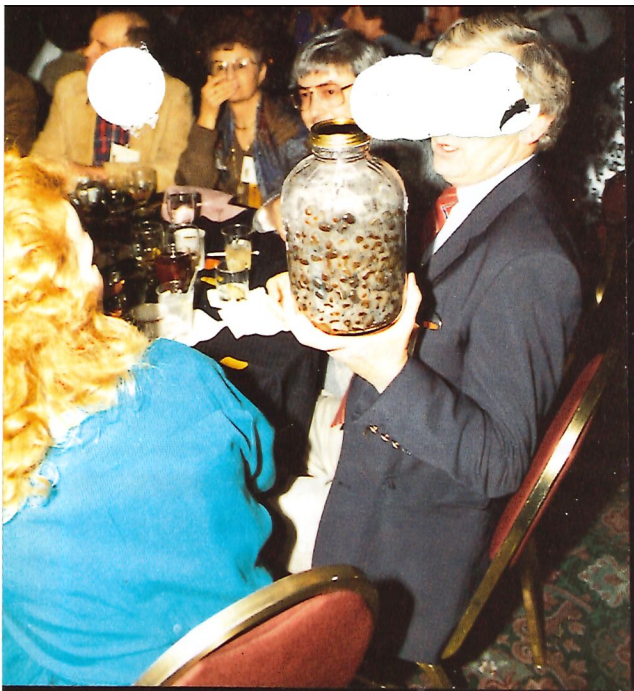






**GRAND BANQUET** 5-30-84









GRAND BANQUET



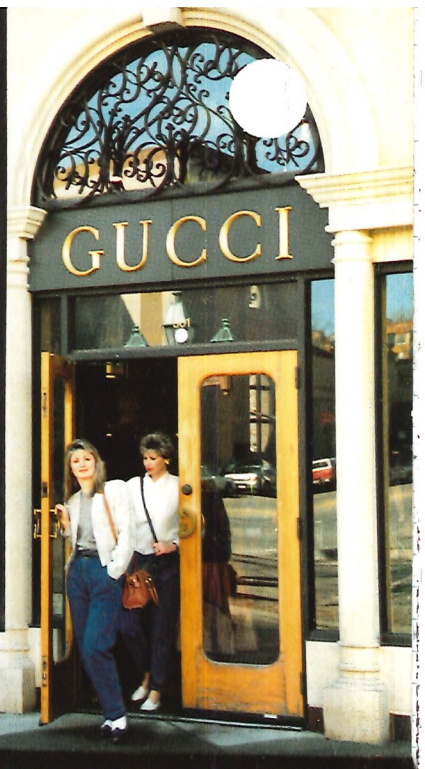




GRAND BANQUET 5-24

# VIDEO AUCTION





LADIES' SHOPPING SPREE





# N.A.E.B.A. CONVENTION BENEFIT AUCTION DONORS

Alberta Game Growers Assn.

Alsager, Rick

Aron, Shawna & Lee, Jay

Aron, Shawna & Lee, Jay

Avery, John

Baldwin, Cecil & Debra

Barber, John

Carmack, Richard

Casey, Kevin

Copithorne, Roy & Judy

Copithorne, Roy & Judy

Erdman, Sumner

Fritz, Jeffrey

Fritz, Jeffrey

Haigh, Jerry

Heins, Lorin & Carole

Homan, Kay

Johnson, Bob, Sr.

Johnson, Rush & Inez

Johnson, Rush & Inez

Killorn, Steve

Lies, Pete & Sandra

Malan, Mark

Malins, Wally & Kaye

McRoberts, Jerry

North, Monte

Olsen, Gerald

Perry, Mark & Ann

Perry, Mark & Ann

Rice, John

Spoklie, Bob

Stoltz, Jim

Ward, Bill

Whittlesey, Dave

Whittlesey, Dave

Wiremakers, LTD

Withiam, Sam

Withiam, Sam

Wolcott, Steve

Woody, Gregg

Woody, Gregg

Browning 12 gauge pump shotgun

2 bottles red stag/2 boxes deer velvet

Ginseng

Velve tablets

Print: "When Fall is in the Air"

Mauser Action KDF. 30.06 Rifle

2 bottles red stag/2 Boxes Deer velvet

Pot-bellied pig

Tranquilizer gun

6-day Banff Wilderness horseback trip

2 gold elk medallions

Case of champagne

Shed elk button belt buckle

Circular saw blade with elk scene painting

Book: "Farming Wapiti/Red Deer"

Northern Whitetail Deer

Print: "Indians Call'em Wapiti"

Breeding bull

Elk antler chandalier

Breeding bull

Scrimshawed elk tooth necklace

Prints: "Bang" & "Royal Mist Elk"

Fence installation labor

2-day goose/duck hunting trip

Wooden Elk carving

Graphic art elk piece

Cooked Buffalo salami

6 rolls Cyclone Fence

12 50 lb. cartons of fence staples

5-day elk hunt in Colorado

2 Elk antler belt buckles

2 round trip airfares anywhere TWA flies

Carving of standing Brown Bear

Elk bugler tooth charm

Elk ivory pendant

12 50 lb. cartons of fence staples

Breeding bull

Print: "King's Crossing"

4 handpainted ostrich eggs

Venison summer sausage

Smoked pheasant

5-37

# N.A.E.B.A. CONVENTION EXHIBITORS

Amass, Keith	Safe Capture Int.
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Bringans, Mike	Coldstream Deer Group
Dailly, Rosse	Langley Wire Industries
Dunlop, Tim	Coldstream Deer Group
Eaton, Coreen	WXICOF
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Heim, George	Exotic Directory
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Jarvis, Kim	Jarvis Insurance Co.
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Johnson, Jani	The Exotic News
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Lawrence, Graeme	Maplehurst Deer Ltd.
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McQuown, Wesley	McQuown Soil Consulting
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Ramage, Wesley	Clearstone Breeding Farm
Ritchey, Grant & Becci	Ritchey Eartags
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Stoltz, jim	Deerfield Farms/Service Travel
Surine, Doug	Extra Sales & Service
Wilkins, Bob	Wilkins Livestock Insurance

5-38

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Alsager, Rick  
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Fence, Ray  
Fence, Ray  
Fence, Ray  
Fritz, Jeffrey  
Fritz, Jeffrey  
Gegenheimer, Lester  
Guthrie, Hugh  
Haigh, Jerry  
Hebert, Mark  
Heins, Lorin  
Heins, Lorin  
Honl, Sydney  
Honl, Randy  
Johnson, Richard  
Johnson, Rush  
Johnson, Robert Sr.  
Johnson, Robert Jr.  
Johnson, Robert Sr.  
Johnson, Robert Sr.  
Jurke, Wilf  
Jurke, Wilf  
Jurke, Wilf  
Kauhl, Rodney  
Langegger, Pepi  
Langegger, Pepi

NAEBA Herd Register #18  
NAEBA Herd Register #19  
NAEBA Herd Register #2  
Graphic Art Elk Piece  
Print: "King's Crossing"  
Elk Chandelier  
Wooden Elk carving  
Print: "Indians call'em Wapiti"  
NAEBA Herd Register #9  
5-day elk hunt in Colorado  
NAEBA Herd Register #17  
NAEBA Herd Register #14  
Summer sausage  
Print: "Skating on Thin Ice"  
NAEBA Herd Register #13  
Tranquilizer gun  
Son of "King Edward" bull calf  
6 rolls Cyclone fence  
Print: "Body Language"  
NAEBA Herd Register #6  
Elk velvet liquid  
Smoke pheasant  
Velvet tablets  
Scrimshaw Elk tooth necklace  
NAEBA Herd Register #22  
Elk Bugler charm  
Fence staples  
Elk tooth pendant  
Fence staples  
NAEBA Herd Register #21  
Bull calf  
Mule deer hunt  
NAEBA Herd Register #1  
Panda Bear pendant  
Print: "Royal Mist Elk"  
NAEBA Herd Register #3  
NAEBA Herd Register #11  
Elk antler belt buckles  
NAEBA Herd Register #23  
NAEBA Herd Register #24  
Case of champagne  
Fence installation labor  
Painted Ostrich eggs

Lolli, Frankie & Domonic Print: "Primrose Ridge"  
Lolli, Frankie & Domonic Print: "Electric Peak"  
Lolli, Frankie & Domonic NAEBA Herd Register #20  
Lolli, Frankie & Domonic Northern Whitetail deer  
Lubinski, Gregory Fence staples  
Malins, Wally Fallow deer hunt  
Malins, Wally Browning 12 gauge pump  
Malins, Wally Shed elk button belt buckle  
Malins, Wally Carving /standing Brown Bear  
McAllister, Frank Print: "Atlantic Flyway"  
Michel, Dale Winchester 20 gauge pump  
Musick, Steve 2 day waterfowl hunt  
Nebenzahl, Ken NAEBA Herd Register #27  
Nebenzahl, Ken 2 gold elk medallions  
Nebenzahl, Ken Son of "Diamond" bull calf  
North, Monte NAEBA Herd Register #4  
Pankow, Jim NAEBA Herd Register #25  
Pankow, Jim 2 elk charms  
Perry, Mark Book: "Among the Elk"  
Perry, Mark NAEBA Herd Register #8  
Pidde, Dr. W.J. NAEBA Herd Register #5  
Poehling, John Deer velvet  
Poehling, John NAEBA Herd Register #12  
Prock, Roger Mauser Action KDF 30.06 rifle  
Prock, Roger NAEBA Herd Register #7  
Ramage, Wesley Book: "Elk of North America"  
Ribelin, George Buffalo salami  
Ribelin, George Book: "Horned & Antlered Game"  
Ribelin, George Print: "Deer Picture"  
Riordan, Judy Print: "The Cub Scouts"  
Romanik, Walt 2 boxes fence staples  
Spoklie, Bob Circular saw blade w/elk scene  
Stoltz, Jim Print: "Tree Line Trails"  
Surrine, Doug Ginseng  
Tank, Gene NAEBA Herd Register #15  
Thurston, Brad Pot-Bellied Pig  
VanDenBerg, George Book: "Records-N. Amer. Big Game"  
White, Lee NAEBA Herd Register #16  
Withiam, Sam NAEBA Herd Register #10  
Withiam, Sam Book: "Farming Wapiti & Red Deer"  
Withiam, Sam 6-day Banff Wilderness on horseback  
Woody, Gregg Print: "Weathered Memories"  
Wyman, Lou 2 airline tickets anywhere TWA flies  
Wyman, Lou Fence staples

5-39

# NUTRITION OF ROCKY MOUNTAIN ELK

## PART 1: REQUIREMENTS FOR ENERGY, FIBER & PROTEIN

By: Bruce E. Watkins, Ph.D.  
Animal Nutrition Consultant

As ruminants, elk have much in common with cattle, sheep, deer, and other ruminants. It is impossible to understand elk nutrition without first being knowledgeable about basic ruminant nutrition. Ruminants have evolved unique strategies for utilizing food resources and face unique problems compared to other types of animals. Microorganisms in the rumen represent a complex, miniature ecosystem that gets the first shot at everything the animal eats. On the plus side, rumen microorganisms provide elk with B-vitamins and vitamin K, obviate the need for specific amino acids or fatty acids in the diet, break down otherwise indigestible plant fibers, and detoxify certain harmful compounds. On the negative side, rumen microorganisms take energy from the diet, often modify already useable nutrients (sometimes making them less useable), limit the animal's ability to utilize diets high in readily digestible carbohydrate or fat, and sometimes produce toxins.

Although all ruminants share much in common with respect to nutrition, there are important differences between species. These differences relate primarily to anatomical and physiological characteristics of the alimentary tract that determine the type of diet that can be utilized most effectively. Ruminants can be classified into 3 categories based on their diet adaptations. Species in the first category, the "bulk or roughage feeders" (e.g., cattle and sheep), have relatively large high fiber diets. Species in the second category, the "concentrate selectors" (e.g., mule and white-tailed deer, moose), have relatively small rumsens and more rapid rates of food passage. These species must be more particular about what they consume; high fiber diets are poorly utilized and can be detrimental. Elk fall into the third category, the "intermediate feeders". As the name indicates, intermediate feeders display certain characteristics of both the other categories. Intermediate feeders can utilize diets higher in fiber than concentrate selectors but are not as well adapted as bulk or roughage feeders. Intermediate feeders adjust well to seasonal and regional changes in diet. Classi-

fication of the elk as an intermediate feeder is supported by comparative digestibility trials: elk are better able to digest fiber than mule or white-tailed deer, but less capable than cattle and sheep. Understanding the capability of elk to utilize fiber is basic to their proper nutritional management not only in the wild, but also in captivity. For example, several times I have heard the claim, especially from hay dealers, that hay too poor for cattle can be used satisfactorily for elk and deer. This is patently wrong and represents a fundamental misconception.

### ENERGY

The energy content of captive elk diets can be inadequate when (1) overly mature roughages are fed without adequate supplementation with a concentrate and (2) when too little food is provided. Inadequate energy intake results in reduced growth or weight loss. In females, a negative energy balance can also cause a reduced rate of conception, fetal resorption, birth of stunted, weak calves, and reduced milk production. An energy deficiency in bulls can result in smaller antlers and reduced libido.

Often times, excess energy intake is a greater problem in captive elk than feeding too little energy. Not only is overfeeding energy wasteful, it also can have adverse effects, particularly in gestating cows. In cattle and sheep, overly fat females have an increased incidence of dystocia, retained placenta, displaced abomasum, and ketosis. It is likely that similar problems can occur in overweight elk. Overly fat bulls may suffer from reduced libido and stamina. High energy diets also might contribute to laminitis or founder in confined elk.

Energy requirements and the energy provided by food can be expressed different ways. Gross energy (GE) is the total amount of energy released upon complete combustion of a food. GE does not take into account the

availability of energy to the animal and is unsatisfactory for practical application. Digestible energy (DE) is equal to GE minus the energy lost in the feces. Metabolizable energy (ME) is equal to DE minus the energy lost in the urine and gaseous products of digestion (e.g. methane). Net energy (NE) is equal to ME minus energy lost as heat due to nutrient processing; NE represents energy actually available to the animal for maintenance, growth, and production. Although NE values are widely used for cattle and sheep, there is little information available on NE values for elk. By far, most data for elk are on a DE basis. Although DE is a cruder measure of energy than NE, it is useful because fecal energy loss is usually the most variable aspect of energy availability. Until more is known, DE is the most practical basis for expressing energy requirements of elk and the energy content of elk diets.

The amount of energy required to maintain constant body weight in an adult elk confined to a small enclosure in a thermoneutral environment can be predicted by the following equation:

$$\text{ME (kcal/day)} = 140 (\text{body weight in kg}^{0.75})$$

For more practical purposes, this equation can be changed to:

$$\text{DE (Mcal/day)} = 0.16 (\text{body weight in kg}^{0.75})$$

For example, a 500 lb. elk would require 9.35 Mcal of DE for minimum maintenance. If 10 lbs. (4.54 kg) of dry matter are consumed per day, at least 2.1 Mcal DE/kg of dry matter would be required in the diet.

Predicting energy requirements over this baseline is difficult because so many variables (e.g., activity, thermal environment, productive status) influence energy expenditure. Factorial models have been developed to calculate energy requirements of free-ranging elk and, in turn, to predict carrying capacity, but these models are too complicated and too

**Table 1. Probable energy and protein requirements of Rocky Mountain Elk (dry matter basis):**

	Maint. <sup>2</sup>	Growth				Gestation		Lactation	
		Antlers <sup>3</sup>	3-6 mo. <sup>4</sup>	6-9 mo. <sup>5</sup>	9-18 mo. <sup>6</sup>	12-24 wk <sup>7</sup>	24-36 wk <sup>8</sup>	0-6 wk <sup>9</sup>	6-12 wk <sup>10</sup>
DE (Mcal/kg) <sup>1</sup>	2.3	2.4	3.0	2.8	2.6	2.5	2.6	2.8	2.7
Crude Protein (%)	7-10	10-12	18-20	16-18	12-14	10-12	12-14	14-16	12-14

**FIBER GUIDELINES**

ADF, min (%)	25	25	16	20	20	20	20	20	20
ADF, max (%)	45-50	45	35	40	45	45-50	45	40	40
NDF, min (%)	35	30	20	25	25	30	30	30	30
NDF, max (%)	65	60	45	50	60	60	60	50	50

DE = digestible energy, CP = crude protein, ADF = acid detergent fiber, NDF = neutral detergent fiber.

- |   |   |
|---|---|
| 1. Based on the use of feed DE values for dairy cattle. | 6. April - December. Also recommended for compensating adults (e.g., breeding bulls regaining condition). |
| 2. Adult bulls and cows, October - February.            | 7. February - March.  |
| 3. Mature bulls, February - August.                     | 8. March - June.  |
| 4. June - December.                                     | 9. May - July.  |
| 5. January - March.                                     | 10. July - September.   |

general for practical application to feeding captive elk.

Rather than attempting to calculate the amount of energy required per animal per day and adjusting the amount of ration accordingly, it is more practical to modify energy intake by offering diets with different energy concentrations and allowing the animal to eat to satisfy its energy requirements. This usually involves feeding a forage free-choice and, if necessary, feeding a concentrate in controlled amounts to achieve the desired energy concentration in the total diet. Total mixed rations which combine concentrate ingredients and forages such as silage, haylage, or chopped hay can also be adjusted to different DE concentrations and fed ad libitum.

Few DE values actually determined for elk are available for feeds commonly used in captivity. DE values for dairy cattle, although not ideal, should provide a reasonable approximation of DE values for elk until more information becomes available. DE values for dairy cattle probably overestimate DE values for elk, especially at lower DE concentrations.

Although DE requirements of elk are not well-defined, digestibility studies, DE content of diets successfully used in captivity, and requirements established for domestic ruminants can be used to estimate probable requirements of animals fed ad libitum (Table 1). DE requirements vary considerably depending on the status (e.g., maintenance,

growth, gestation, lactation) of the animal. Ideally, animals of similar status should be grouped together for efficient feeding.

Non-producing adult elk in good condition should be fed a DE concentration that maintains fairly constant body weight. Bred cows can be fed maintenance diets from approximately October through January. Non-breeding bulls can be fed maintenance-type diets year-round, although an increase in DE may be desirable during early spring and summer to help achieve maximum antler growth.

DE requirements for gestation are a combination of maintenance needs plus the requirements for the developing conceptus. Relatively little fetal growth occurs during the first trimester of gestation (Sept. - Dec.) in elk and other ungulates. During this period, DE requirements for gestation are little different from those for maintenance and the DE concentration in the diet should maintain body weight but not result in weight gain. About 20-30% of conceptus growth occurs during the 2nd trimester (Dec.-March) and about 60-80% occurs during the last trimester (March-June). Nutrient demands for conceptus development therefore correspond with changes in plant phenology and nutrient availability in the wild. During the 2nd trimester, DE concentration in the diet can be gradually increased above maintenance levels but should not result in excessive weight gain. During the

3rd trimester, DE concentration in the diet should be increased (e.g., 10-20% over maintenance levels) to support fetal growth and ensure good body condition during lactation.

Lactation and early growth are the most energetically demanding times for elk. A lactating cow's DE requirements above maintenance are determined by the amount of milk produced and the energy content of the milk. Elk milk, exclusive of colostrum, averages about 1.2 Mcal/kg. A cow elk with a single calf produces about 7 lbs/day of milk during the first week of lactation increasing to about 9 lbs/day at peak lactation. Peak lactation in elk occurs 3-4 weeks after calving (for comparison, peak lactation in cattle occurs at about 6-8 weeks). Just as in cattle, a lag between peak lactation and peak feed intake occurs in elk. Available evidence suggests that peak intake occurs about 10-12 weeks postpartum in elk; in dairy cattle, maximum intake usually occurs about 12-14 weeks postpartum. Dairy cattle typically lose weight during the first 3 months of lactation because their high rate of milk production (e.g., sometimes 100 lbs/day or more) cannot be supported by diet alone; body reserves must also be utilized. In contrast, records for captive elk indicate cows can maintain or even gain weight during early lactation given a diet high enough in DE (e.g., >2.6 Mcal DE/kg or dry matter).

Lactation in elk lasts for 120 or more days. However, after about 100 days, milk

production probably declines to requirements of the cow begin to return to maintenance levels. For cows that have lost weight during lactation, continuing to provide DE in excess of maintenance can help them regain condition through the breeding season.

DE requirements for growth apply to (1) young animals growing in stature, (2) adults regaining condition, and (3) bulls growing antlers. Energy requirements for growth are a function of the amount of tissue gained and the energy content of the gain. Little information is available on the energy content of gain in elk. Therefore, DE requirements for growth must be extrapolated primarily from studies with cattle.

During the rut, feed intake decreases and activity increases in breeding bulls. Substantial weight loss can occur in breeding bulls during this period. Because feed intake is reduced, increasing the DE concentration of the diet during the rut will not prevent weight loss. Therefore, it is important that breeding bulls be in good condition before the breeding season and, after the rut is completed, the DE concentration in the diet should be increased to help them regain condition.

Inadequate energy in the diet can reduce antler growth in deer and, presumably, in elk. However, energy requirements for antler growth probably represent only a small increment over maintenance requirements. Bulls in good body condition in the spring should require little if any increase in diet DE to support antler growth.

Proportions of concentrate to forage required to obtain specific DE concentrations in the diet for 2 sample concentrates and 2 sample forages are provided in Table 2. Note that mature forages (3.g., 2.2 Mcal DE/kg) require supplementation with a concentrate for all types of elk, even for maintenance. Conversely, a good quality forage (2.7 Mcal DE/kg) should be adequate to meet the energy requirements of all types of elk except young, weaned calves and, perhaps, cows during early lactation.

The energy content of forages, both within and among plant species, can be highly variable. Stage at cutting is the most important factor influencing DE content within hay types. DE decreases as forages mature. Ideally, forages should be analyzed to obtain an estimate of their DE concentration. Hay can

be analyzed using near-infrared technology or as little as \$10.00 - a worthwhile investment. Although hay analysis will not provide an energy value for elk, predicted DE or TDN values for dairy cattle are typically included. DE values can be estimated from TDN as follows:

$$DE \text{ (Mcal/kg)} = 0.04409 \text{ (TDN\%)}$$

If DE or TDN values are not available, Table 3, developed for dairy cattle at the University of Wisconsin, can be used to estimate the DE concentration in forages based on their acid detergent fiber and crude protein content. In lieu of an actual forage analysis, NRC feed composition tables (e.g., Dairy 1989) can be used to estimate composition based on forage type and stage of maturity.

Feeding forage ad libitum along with controlled amounts of concentrate requires an estimate of feed intake to determine how much concentrate should be offered. Feed intake by elk varies depending on the energy concentration of the diet and energy requirements. On low energy diets, elk cannot consume enough energy to meet their requirements because of the physical limitations of the digestive tract. The lower the DE content of the diet, the more

(Continued on Page 48)

**Table 2. Proportions (% , as fed basis) of forage & concentrate required to obtain different digestible energy (DE) concentrations (mcal/kg, dry matter basis) in the diet. Forages and concentrates are assumed to be 90% dry matter.**

DE	Combination 1		Combination 2		Combination 3		Combination 4	
	CONC. 3.1	FORAGE 2.2	CONC. 3.1	FORAGE 2.7	CONC. 3.6	FORAGE 2.2	CONC. 3.6	FORAGE 2.7
2.3	11	89	0	100	7	93	0	100
2.4	22	78	0	100	14	86	0	100
2.5	33	67	0	100	21	79	0	100
2.6	44	56	0	100	29	71	0	100
2.7	55	44	0	100	36	65	0	100
2.8	67	33	25	75	43	57	11	89
2.9	78	22	50	50	50	50	22	78
3.0	89	11	75	25	57	43	33	67

DE = Digestible energy (Mcal/kg of dry matter) concentration in the diet. Refer to Table 1 to select appropriate DE concentrations.

CONC. 3.1 = Concentrate containing 3.1 Mcal DE/kg (dry matter basis). Examples: Mixture of grain, soybean meal, mineral/vitamin supplement, and roughage (e.g., alfalfa meal, corn cob, soybean hulls, oat hulls); 16% ADF concentrate pellet.

CONC. 3.6 = Concentrate containing 3.6 Mcal DE/kg (dry matter basis). Examples: Poor to fair quality hay such as mature alfalfa hay (12-14% crude protein) or mature grass hay (5-7% crude protein).

FORAGE 2.2 = Forage containing 2.2 Mcal DE/kg (dry matter basis). Examples: Poor to fair quality hay such as mature alfalfa hay (12-14% crude protein) or mature grass hay (5-7% crude protein).

FORAGE 2.7 = Forage containing 2.7 Mcal DE/kg (dry matter basis). Examples: Good quality hay such as late vegetative or early bloom alfalfa hay (18-19% crude protein); early bloom grass hay (10-15% crude protein).

# North American Elk Breeders Association, Inc.

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Thornhill, Ontario

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University of Saskatchewan  
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Hebert, Mark and Takako  
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Hurl, Deryl  
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Jensen, Tom & Diane  
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Millet, Alberta

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Tavani Wapiti Ranch  
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Nova Scotia, CAN

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Azcarraga, Martin & Donna  
Fruita, CO

Baldwin, Cecil and Debra  
Rancho Venado  
Mancos, CO

Barber, W.C. and Beverly  
Diamond J Ranch  
Denver, CO

Barber, John Vincent  
Ute Elk Ranch  
Longmont, CO

Colson, Ron S.  
Lakewood, CO

Davis, Harold and Katie  
Diamond J Ranch  
Walden, CO

Geer, Newell G. & Bobbie Jo  
Diamond J Ranch  
Walden, CO

Haller, Marc E.  
Rita Alto Elk  
Moffat, CO

Hardman, Dirk & Sheri  
Lone Cone Elk  
Norwood, CO

Henington, Michael  
Avery Ranches  
Durango, CO

Herber, Ed  
Arvada, CO

Hill, Gary & Barbara  
Collbran, CO

Holcomb, Ralph  
Mountain Valley Game Ranch  
Alamosa, CO

Hopper, Dan  
Hopper-Vandenberg Ranch  
Durango, CO

Johnson, Alvin & Reba  
Johnson Ranch  
Burlington, CO

Kissire, Bill or Drew  
Black Canyon Lodge/K&W Outfitters  
Maher, CO

Langegger, Pepi  
Twin Creek Ranch  
Vail, CO

Metcalf, Burt & Barbara  
Montrose, CO

Noland, Dick and Laura  
Kannah Creek Elk Ranch  
Whitewater, CO

Perry, Mark and Ann  
Ute Elk Ranch  
Longmont, CO

Porter, Terry  
New Castle, CO

Prock, Roger and Linda  
Prock Elk Ranch  
Montrose, CO

Quick, Andrew  
Diamond J Ranch  
Walden, CO

Quincan, Brian  
Antonito, CO

Ritchey, Grant & Dawn  
Ritchey Sales  
Brighton, CO

Rodreick, Dan and Mary  
Rodreick Ranch  
New Castle, CO

Savage, Roy  
Roy Savage Ranches  
Rifle, CO

Schanfield, Moses & Nancy  
Analytical Genetic Testing Center  
Denver, CO

Schmueser, Larry  
Belodi Creek Ranch  
Rifle, CO

Smith, Delbert  
Cottonwood Ridge Wildlife Zoo  
Grand Junction, CO

Smitherman, Steve N.  
Elk Park Ranch South  
Allenspark, CO

VanDenBerg, George  
Durango, CO

Wapiti Game Ranch  
LaVeta, CO

White, Marvin and Billie  
Leroux Creek Elk Ranch  
Hotchkiss, CO

Whittlesey, Dave and Sue  
Steamboat Springs, CO

Wilcox, Lawrence  
Mtn. Valley Game Ranch  
Alamosa, CO

Wolcott, Steve  
Paonia, CO

Wyman, Lou and Paula  
Wyman Elk Ranch  
Craig, CO

### FLORIDA

Ard, Watha & Jimmie Lou  
Tallahassee, FL

McClure, Brett and Susan  
Ft. Pierce, FL

### GEORGIA

Curtis, Henry and Lonnie  
Elk Overlook  
Ranger, GA

Denny, John F.  
Roopville, GA

Guthrie, Hugh  
Nashville, GA

### HAWAII

Erdman, Sumner  
Ulupalakua Ranch  
Maui, HI

### IDAHO

Ferguson, Michael  
Velvet Ranch  
Rexburg, ID

Guess, Dr. Charles  
Moscow Mtn. Elk Ranch  
Moscow, ID

Jolley, Shane and Debra  
Kuna, ID

Maffey, Dave  
Boise, ID

McGrath, Stephen  
M Lazy S Ranches  
Idaho Falls, ID

Melina, Carl & Lois  
Lone Hawk Farm  
Moscow, ID

# North American Elk Breeders Association, Inc.

## List of Members as of June 1, 1991

Puppos, Mike  
Velvet Ranch  
Rexburg, ID

Summers, Danny  
Summers Farm & Ranch  
Sugar City, ID

### ILLINOIS

Ault, Scott and Marilyn  
Circle A Farms  
Good Hope, IL

Borrows, Walter & Helen Lucille  
City Life Ranchers  
Park Ridge, IL

Crabtree, Mike and Jennie  
C&H Elk Farm  
Lebanon, IL

Dugan, Steven  
Three Creeks Elk Ranch  
Mascoutah, IL

Getz, John and Anna May  
Morton, IL

Goike, Donald  
Uniform Tooling  
Stillman Valley, IL

Hardin, Amy  
Belevedere, IL

Johnson, Sr., Robert  
Hardrock Game Farms  
Egan, IL

Kyle, Susan  
Caledonia, IL

Lawson, John E.  
White Pines-Deer Park, Inc.

Nebenzahl, Kenneth & Jossy  
Glencoe, IL

Rohner, Larry & Judy  
Centralia, IL

Skiba, Mark  
Northlake, IL

White, Robert and Rhonda  
O'Fallon, IL

### INDIANA

Hocter, Pat and Sharon  
Animal Finders Guide  
Prairie Creek, IN

Ingle, Bill and Roxanne  
Deercreek Farms, Inc.  
Williamsburg, IN

Wilson, Fred  
Terre Haute, IN

Wise, Duane  
Muncie, IN

### IOWA

Barrett, Gary and Heidee  
East Fork Elk Ranch  
Armstrong, IA

Bohlen, Henry and Barb  
Wildlife Lakes  
West Burlington, IA

Broers, Bardelt and Julie Ann  
Mason City, IA

Buckmaster, Raleigh  
Buckmaster Fallow Farm  
Lansing, IA

Forbes, Phillip  
Marilyn Farms Co.  
Kalona, IA

Funk, Anthony  
Hunter Creek Ranch  
Humeston, IA

Good, Craig and Darla  
Cherokee, IA

Hancock, A.W. Bill & Patty  
Hancock Farms  
Otumwa, IA

Hanke, Bob & Rita  
Elk-R-Us  
Osage, IA

Hemphill, Robyn  
Davenport, IA

Kaufman, Leroy and Carolyn  
Rolling Acres Animal Farms  
Wayland, IA

McCarty, Chuck  
Chariton Valley RC & D Inc.  
Centerville, IA

Peters, David and Nancy  
David W. Peters, Inc.  
Urbandale, IA

Schmidt, Rod  
Manager - Plum Creek Elk Ranch  
Algona, IA

Sutcliffe, Lyndon  
Mason City, IA

Usher, Larry and Jean  
Usher's Llama Farm  
Ionia, IA

Vittetoe, Edwin and Diana  
Washington, IA

### KANSAS

Anderson, Ken  
Anderson Elk Ranch  
Morganville, KS

Bartel, Donald & Gayle  
Animal Acres  
Augusta, KS

Beesley, Jim and Cynthia  
Mid-America Cattle Co.  
Hugoton, KS

Denniston, Lynn & Le  
Levenwerth, KS

Fouts, Jim and Sherri  
Tanganyika Wildlife Center  
Wichita, KS

Hathaway, Gary R.  
Ulysses, KS

Kaufman, Lynn and Karen  
Underhill Farms  
Moundridge, KS

McCullom, Mac  
X Flint Hills Exotic Ranch, Inc.  
Cottonwood Falls, KS

Smith, Ray O.  
Circle 3 Ranch  
Longford, KS

White, Lee & Kaila  
Elk Horn Ranch  
Fredonia, KS

Willsey, Duane  
Hugoton, KS

### LOUISIANA

Kelley, Jimmy  
Kelley's Game Farm  
DeRidder, LA

Killian, Oscar  
Killian Elk & Game Farm  
Bossier City, LA

Painting, Dudley  
Loranger, LA

### MASSACHUSETTS

Chagnon, Jill  
South Hamilton, MA

O'Brien, Timothy  
Texas Instruments  
Attleboro, TX

### MEXICO

Gutierrez, Juan  
Agropecuaria Mendocinas  
San Angel, MX

### MICHIGAN

Bur, Joseph & Suzanne  
Cheboygan, MI

Cauley, Jim & Karen  
Back Forty, Inc.  
Goodrich, MI

Chase, Chris  
Stanwood, MI

Clark, Ken  
Clark-Severn Elk Farm  
elio, MI

Goff, Ward & Penny  
Stoney Ridge Game Farm  
Delton, MI

Johnson, Richard & Patti  
Croton Dev. - Wildlife Place  
Newaygo, MI

Kauranen, John & Kathleen  
Root Cellar  
Marenisco, MI

Mowery, Tom & Loreli  
Blissfield, MI

Romanik, Walt & Marilyn  
Renegade Ranch  
Cheboygan, MI

Salsgiver, Dennis & Sandy  
Davison, MI

### MINNESOTA

Campbell, Jerry & Linda  
Stony Brook Game Farm  
Pequot Lakes, MN

Chan, Frank J.  
Chans Maple Lake Game Farm  
Alexandria, MN

Erickson, Richard P.  
Lifetouch Inc.  
Minneapolis, MN

Heins, Lorin & Carole  
Heins Ranch  
Millville, MN

Hoehne, Karl & John  
Hoehne Brothers  
Pine Island, MN

Honl, Sydney & Rand  
Gaylord, MN

Kantrud, Steven & Jo  
Lost Highway Elk Ranch  
Vergas, MN

Kruckeberg, Kevin & Cheryl  
Kruckeberg's Game Farm  
Blooming Prairie, MN

Lubinski, Greg & Lorna  
Lubinski Elk Acres  
Plainview, MN

Matejcek, Ray & Marilyn  
Matejcek's Game Farm  
Owatonna, MN

Michel, Dale & Lucille  
Michel Farms  
Rockester, MN

Michel, Dean & Heidi  
Michel Farms  
Zumbro Falls, MN

Schwartz, Joe & Judy  
Sleepy Eye, MN

Smith, Carl  
Morris, MN

Tank, Gene & Rhonda  
Deerland Zoo  
Brainerd, MN

Wavrin, Tom  
Oak Spring Farm-Midwest Fence  
Medford, MN

Wernsing, Dennis & Karleen  
Chokio, MN

### MISSISSIPPI

Anderson, Dale & Judy  
Incognito  
Liberty, MS

### MISSOURI

Baer, Andy & Joyce  
Andrew Baer Farms  
Salisbury, MO

Bellamy, Glenn & Marilyn  
Easton, MO

Bland, Troy & OK Sun  
Bland Animal Paradise  
Birch Tree, MO

Busch, Andrew D.  
Grant's Farm  
St. Louis, MO

Carmack, Richard & Diane  
Carmack Farms  
Glasgow, MO

Clark, Kenny J.  
New Cambria, MO

Conrad, Mike  
Wrenn Insurance  
Kansas City, MO

Eaton, Don & Coreen  
WXICOF Woolly Woods  
Wentzville, MO

Fralei, Tom & Barb  
Fralei Ranch  
Newburg, MO

Gault, Everett III  
Branson, MO

Hale, Dave  
H & H Exotic Sale, Inc.  
Cape Girardeau, MO

Hinkebein, Kevin & Marge  
Hinkebein Ranch  
Farmington, MO

Hostettler, Sam  
Hostettler Wildlife Farm  
Buffalo, MO

Humes, Alfred & Darlene  
Wyaconda, MO

Johnson, Rush & Inez  
Johnson Elk Farm  
Bucklin, MO

Linder, Jim & Nathalie  
Linder Elk Ranch  
Macon, MO

Lolli, Frankie & Domonic  
Lolli Brother  
Macon, MO

Macher, Ron  
Clark, MO

Malins, Wally & Kaye  
Malins Farms  
Marceline, MO

Miller, Bill  
Exotic Trader  
Gainsville, MO

North, Monte & Ruth  
Imperial Park, Inc.  
Marceline, MO

Peterson, Jeff  
Jackson City Parks & Recreation  
Blue Springs, MO

Ruark, Alva & Judy  
Savannah, MO

Russell, George & Jackie  
Wild Hill Game Farm  
Thayer, MO

Ryals, Gerald & Colleen  
Wild Country Game Farm  
Unionville, MO

Sayre, Bill & Conda  
Sayre Auction Co.  
St. Catherine, MO

Schneider, Chris  
Aries Livestock Insurance  
Rich Hill, MO

Scholle, Norvell & Eleanor  
Carrollton, MO

Schroeder, Larry & Gienda  
Atlanta, MO

Sloan, John & Linda  
Windcrest Farms  
Hallsville, MO

Stoltz, Jim  
Deerfield Farms  
O'Fallon, MO

Winship, Bruce & Cynthia  
Liar's Lake  
Sparta, MO

Woody, Gregg  
Rt 3, Box 488  
Buffalo, MO



# North American Elk Breeders Association, Inc.

## List of Members as of June 1, 1991

### MONTANA

Bird, R.H.  
F.W.P. Ranch  
Helena, MT

Britton, Levi  
Yellowstone Game Ranch  
Emigrant, MT

Buchanan, John  
Great Falls, MT

Christison, Jerry & Genevieve  
Sleeping Giant Ranch  
Helena, MT

Corbett, Pat & Connie  
Signey, MT

Kesler, David & Darlene  
Kesler Farming & Ranching  
Phillipsburg, MT

Killorn, Steve & Julie  
Big Bull Elk Ranch  
Martinsdale, MT

Krogedal, Merlé & Sharon  
Sandhill Game Ranch  
Froid, MT

Lunder, Dale.  
Red Barn Prod. Double D Ranch  
Billings, MT

Mangel, Darrell & Doug  
Westby, MT

Miller, Mike  
Elk Valley Game Ranch  
Hardin, MT

Musick, Steve  
Judith River Ranch  
Hilger, MT

Schenck, Ray  
Elk Glen  
East Lake Shore  
Bigfork, MT

Shaw, David & Kristina  
Loma, MT

Spoklie, Bob  
Spoklie Elk Ranch  
Antelope, MT

Stip, Henry & Beverly  
Yellowstone Game Ranch  
Sidney, MT

Stranahan, Duane  
Crazy Mountain Brangus  
Wilsall, MT

Swanser, Ward & Judy  
Flying V Elk Ranch  
Billings, MT

Wambers, Lloyd & Betty Lou  
Diamond V Cattle Ranch  
Whitefish, MT

Williams, Kent  
Wagon Wheel Ranch  
Columbus, MT

### NEBRASKA

Curry, John A.  
Eagle Creek Lodge  
Columbus, NE

Johanson, Johnny & Kathy  
North Platte, NE

Johnson, Thomas  
Juniata, NE

McRoberts, Jerry  
McRoberts Game Farm  
Gurley, NE

Neidhardt, Maureen  
Rare Breeds Journal  
Crawford, NE

Poehling, John & Diane  
Woodcliff Big Game Ranch  
Fremont, NE

Wellnitz, James F.  
Wellnitz Elk Ranch  
Rushville, NE

### NEVADA

Fuller, William & Ronna  
Gardnerville, NV

Leverton, Hershel  
Alpine Buffalo & Llama  
Las Vegas, NV

### NEW HAMPSHIRE

Vaillancourt, Joseph  
Stratham, NH

### NEW JERSEY

DeSapio, Anthony & Alexandria  
Baptistown, NJ

Walsh, Robert T., MD  
Gilkie Hill Farm  
Summit, NJ

### NEW MEXICO

Baltzley, Clifford  
Bar X Bar Ranch  
Pecos, NM

Canning, R.A.  
Canning Ranches  
Riadoso, NM

Simms, Frank  
Chama Land & Cattle Co.  
Chama, NM

Wiltse, Duane  
MT Taylor Ranch  
Cubero, NM

### NEW YORK

Barrows, Gordon H.  
Z3 Ranch  
New York, NY

Bauer, Jeff & Sherri  
Cascade Ranch  
Jamestown, NY

Jones, Buck & Ray  
Kyle, Robert A.  
New York, NY

Shin, Richard and Gae  
White Plains, NY

Smith, Kathy  
Keene Valley, NY

Stocklosa, Thomas  
Black River Game Farm  
Alder Creek, NY

White, Michael and Theresa  
Sky Tangent Farms  
Addison, NY

### NEW ZEALAND

Lawson, Samuel W.  
Massey, Auckland 8  
New Zealand

Wiremakers, Ltd.  
Otahuha, Auckland  
New Zealand

### NORTH CAROLINA

Perdue, Olin and Norma  
Beaverhorn Ranch  
Vilas, NC

Smith, Tom & Martha  
Salisbury, NC

### NORTH DAKOTA

Egeland, Craig and Bobbie  
Rhame, ND

Lies, Peter  
Lies Game Farm

Mau, Ernest & Sharon  
Silverwing Ranch  
Tolley, ND

Neidhardt, Maureen  
Rare Breeds Journal  
Hebron, ND

Stevens, Lynn and Judy  
Wapiti Ranch  
Glenburn, ND

Stip, Ray  
Minot, ND

### OHIO

Brondes, Phillip, Jr.  
Toledo, OH

Close, Oliver  
Hickory Hill  
Nova, OH

Cooper, Pat  
Wild and Wooly Acres, Inc.  
Hopedale, OH

Osting, Dick & Kay  
Woods & Waters  
Delphos, OH

Osting, Ben & Kim  
Woods & Waters  
Delphos, OH

Paul, Marriselle  
Bonnie Brae Farms  
Wellington, OH

Potts, Eddie & Sherri  
White Oak Exotic Hunting Preserve  
Senecaville, OH

Rodabaugh, Robin  
White Deer Downs  
Hartville, OH

Weaver, Daniel & Betty  
Pioneer Acres  
Holmesville, OH

Yoder, Mose and Katie  
Butler, OH

### OKLAHOMA

Embry, David  
Tulsa, OK

Garrett, Vic  
Arbuckle Wilderness  
Davis, OK

Goddard, W.R. and Bill  
Goddard Ranch  
Ardmore, OK

Killian, C.C. & Mary Ann  
Killian Exotics USA, Inc.  
Sayre, OK

Martin, Robert & Jacquelyn  
Cushing, OK

McGuffee, Ron  
Wings and Hooves  
Chander, OK

Parker, Robert L. Sr.  
Tulsa, OK

Taylor, Ken  
Okie Elk Farm  
El Reno, OK

Withiam, Sam  
Timberline Ranch  
Cushing, OK

### OREGON

Babcock, Mike  
Oregon Elk  
Yoncalla, OR

McCamman, William  
New Zealand Fence Systems  
Boring, OR

McClammy, Richard P.  
Wandering Stars  
Baker City, OR

Patterson, Richard  
The Patterson Ranch  
Sisters, OR

Vincent  
Bend, OR

Woosley, Lonnie and Louise  
Florence, OR

### PENNSYLVANIA

Altmeyer, William and Ruth  
Altmeyer Farm and Stable  
Kittanning, PA

Bukovitz, Gerald W.  
Jerry's Wild Animal Farm  
McClellandtown, PA

Davis, John & Rebecca  
Rebecca Enterprises, Inc.  
Lock Haven, PA

DeRea, Anthony  
Elk Ridge of Iris, Inc.  
Wellsboro, PA

Larock, Joe and Janice  
Sugarloaf, PA

MacKrell, Gary  
Whispering Pines Farms  
Chicora, PA

Pneu-Dart, Inc.  
Williamsport, PA

Schleiden, Russell E.  
Penn's Cove  
Centre Hall, PA

Yeagle, George  
Yeagle Excavating  
Warren, PA

### SOUTH CAROLINA

Wright, Bill  
Anderson, SC

### SOUTH DAKOTA

Casey, Kevin  
Bear Country USA  
Rapid City, SD

Casey, Brendan P.  
Bear Country USA  
Rapid City, SD

Herrman, Dean  
Black Hills Elk, Inc.  
Sturgis, SD

Karber, Roger  
Clark, SD

Paulton, Bill  
Paulton Ranch  
Hot Springs, SD

### TENNESSEE

Autry, David L.  
H&A Livestock Ranch  
Lexington, TN

Comer, T.W. "Wick"  
Wilson Farms  
Hendersonville, TN

### TEXAS

Alburtis, Rocky and Patti  
Royal Elk Ranch, Inc.  
Lubbock, TX

Bailey, C.R. (Randy)  
Midland, TX

Barker, Emzy T., III  
Brushy Creek Custom Sires  
Taylor, TX

Barnhart, L. Irvin  
Houston, TX

Beecherl, Louis A., Jr.  
Flat Top Ranch  
Dallas, TX

Boyd, Noel  
Exotic Capture Corp.  
Kerrville, TX

Broomfield, Dave and Elizabeth  
Lazy B Exotic Animal Ranch  
Normangee, TX

Brown, Wilson  
Spring Hill Farm  
Dallas, TX

Danos, Wally  
Exotics Unlimited  
Fredericksburg, TX

Daugherty, Jack R.  
JRD Ranch  
Strawn, TX

Deering, Robert  
Ft. Worth, TX

Delavan, Coleman and Bobby  
Delavan Game Ranch  
Fredericksburg, TX

Follett, Mike and Carolyn  
Chicon Creek Ranch  
Dallas, TX

# North American Elk Breeders Association, Inc.

## List of Members as of June 1, 1991

Foster, Jesse Q.  
J.Q.F. Exotic Ranch  
Sterling City, TX

Gegenheimer, Lester  
Cotton Mesa Ranch  
Corsicana, TX

Glazer, R.L. & Brandon  
Blazing Saddles Ranch  
Winona, TX

Gottesman, James and Doris  
Gottesman Ranch  
Houston, TX

Greeling, Don & Donna  
Denton, TX

Guenther, Jack and Valerie  
Double U Spring Branch Ranch  
San Antonio, TX

Holden, Don and Jewell  
Holden H-2 Ranch  
Fredericksburg, TX

Hughes, Michael and Elizabeth  
Broken Arrow Ranches  
Ingram, TX

Johnson, Jr., Robert  
South Padre Island, TX

Jordan, Buddy and Nancy  
NJB Exotic Game Ranch  
Bulverde, TX

Kingan, Bruce  
Exotic Capture Corp.  
Kerrville, TX

Leon, CD "Toad"  
More or Less Ranch  
Abilene, TX

McGlothlin, Kent  
Graham, TX

McLean, Jimmy & Vicki  
Triple M Exotics  
Killeen, TX

Medore, C.P. & Brenda  
Sandstone Mountain Ranch  
Llano, TX

Mikeska, Reuben and Janell  
Three-Mikes, Inc.  
Temple, TX

Moore, Jack  
Moore's Game Ranch  
Ingram, TX

Parnell, Donald  
Ft. Worth, TX

Pietsch, Arlen W. & Josephine  
Peach Creek Ranch  
New Braunfels, TX

Priour, Dale  
Priour Brothers Ranch  
Ingram, TX

Ray, Bernard and Kay  
Indianhead Ranch, Inc.  
Del Rio, TX

Rives, Chick  
Exotic Wildlife  
Lampasas, TX

Rod, R.J.  
Rod Ranch  
Brookshire, TX

Rohmfield, Ray and Rebecca  
R and R Exotics  
Ballinger, TX

Rotter, Robert  
Hidden Hills Ranch  
Dripping Springs, TX

Schreiner, Louis and Chrisie  
YO Ranch  
Mountain Home, TX

Taylor, Ron and Joan  
Taylor Saddle Mountain Ranch  
Camp Wood, TX

Wiley, CB  
Wiley and Sons Tranquilizing  
Wills Point, TX

Williams, Max and Carolyn  
Spring Ranch  
Dallas, TX

Williamson, Ken  
Huntingco, Inc.  
Llano, TX

Worthington, Donny  
Tortuga Ranch

Young, Ron & Barbara  
Expeditions  
Corpus Christi, TX

### UNITED KINGDOM

Walker, Gerald and Pam  
Maplehurst Deer Farm  
Worthington, West Sussex

### UTAH

Homan, Kay  
Providence, UT

### WASHINGTON

Baker, Robert V.  
Spokane, WA

Bridgewater, Jack and Myra  
Raymond, WA

Lavine, Gary  
Windy River Co.  
Lyle, WA

Lutovsky, Greg & Sue  
For Ever Green Inc.  
Federal Way, WA

Sargent, Viola  
Mt. St. Helen's Game Farm  
Woodland, WA

Schreiner, Jack  
Schreiner Farms  
Dallesport, WA

Stellick, Tom & Janine  
Quixote Llamas  
Redmond, WA

### WEST VIRGINIA

Davis, Roger  
Elizabeth, WV

### WISCONSIN

Bushman, Jonathon & Sandy  
Wittenberg, WI

Cano, Joe  
Viola, WI

Eckert, Bernard  
Rhineland, WI

Fritz, Larry & Sandra  
Fritz Fair Game Farm  
Owen, WI

Gerdes, Larry & Mary  
Valley Springs Trout Farm  
Bay City, WI

Hanson, Ray & Marjorie  
B & R Products, Inc.  
Chetek, WI

Herr, Richard  
Elk Sales, Inc.  
Delafield, WI

Holliday, Ike  
Holliday Acres  
Gay Mills, WI

Jamison, Leroy  
Platteville, WI

Jarvis, Dean & Joyce  
Rolling Thunder Game Farm  
Owen, WI

Korleski, James & Shari  
Korleski Enterprises, Inc.  
Brodhead, WI

Krueger, Herbert Sr.  
Valders, WI

Krueger, Ruben & Lillian  
Elk Creek Ranch  
Wausau, WI

Loveland, Robert & Catherine  
Loveland Farms  
Greenfield, WI

O'Meara, Daniel B  
Knapp, WI

Pankow, Jim Jr. & Kris  
Wapiti Meadows  
Plymouth, WI

Randall, Arthur  
Randall Farms  
Mauston, WI

Schueller, Don  
Marshfield, WI

Seffrood, Donald & Ann  
South Wayne, WI

Sieker, Alan & Marlene  
Manitowoc, WI

Sperber, Eugene Sr. & Jeanette  
Sperber Forest Products, Inc.  
Valders, WI

Stephens, Bruce, DVM  
Cameron, WI

Waschbisch, Frank & Jeanne  
Triple F Game Farm  
Oconto Falls, WI

Winnie, Gail R.  
Bearskin Wildlife Reserve  
Harshaw, WI

Zwiefelhofer, Ken  
Elk Horn Acres  
Bloomer, WI

### WYOMING

Dorance, John  
The Business of Game Ranching  
Gillette, WY

MacCarty, Martin  
NX Bar Ranch  
Sheridan, WY

MacCarty, Greg  
NX Bar Ranch  
Sheridan, WY

MacCarty, Brian & Petey  
NX Bar Ranch  
Sheridan, WY

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Extension 547

# North American Elk Breeders Association

## Committee appointments

At a Board of Directors meeting in Moberly, Missouri on April 13, 1991, the following committees were appointed. Following the meeting, each committee met for the first time. We encourage all members to directly communicate with committee chairmen regarding matters of interest to said committee.

### ETHICS & ARBITRATION COMMITTEE

Lester Gegenheimer - CHAIRMAN  
Lorin Heins  
James Korleski  
Pepi Langedgar  
Steve McGrath  
Mark Perry  
Ray Schenck

To investigate any claim of alleged unethical activity brought against any member, applying rules of fair play and justice, and keeping in mind the purposes of the code of ethics adopted by the Association; to report the findings and conclusions of said investigation to the Board of Directors with a recommendation for action by said Board; to keep foremost in the minds of the members of the Association that we have a code of ethics, that we are serious about it and that only by building upon it will the Association grow strong.

To provide a voluntary mechanism for resolution of disputes between members with the general goal of elimination of disagreement that would create friction within the Association.

### RESEARCH & ANIMAL HEALTH COMMITTEE

Kevin Casey  
Mike Ferguson  
Charles Guess  
Frank McAllister  
Brian MacCarty  
Steve Musick - CO CHAIRMAN  
Dave Whittlesey - CO CHAIRMAN

To engage both scientific and practical thinking toward the improvement of the health of those species represented by our Association; to finance research projects designed to improve the overall health and well-being of our animals; to work with members in areas of specific conflict concerning animal health, supporting those members as long as the general goals and purposes of the Association are upheld and maintained; to support and defend humane treatment of all animals and in particular those species specifically represented by our Association.

### GOVERNMENT LIASION COMMITTEE

Jerry Christison  
John Hoehne  
Norm Moore  
Bob Spoklie  
Bill Ward - CO CHAIRMAN  
Steve Wolcott - CO CHAIRMAN

To work with all governmental agencies both State and National (U.S.) and Provincial and National (Canada) in resisting through education, all proposed legislation that will interfere with the free enjoyment of ownership and the perpetuation of elk; to support said entities in enactment of legislation that will fairly and honestly protect the interests of the animals themselves, the industry, and society in general.

### REGISTRATION & MARKETING COMMITTEE

Rick Alsager  
Wick Comer  
Bob Johnson, Sr.  
Pete Lies  
Greg Lubinsky  
Frankie Lolli  
Monte North - CHAIRMAN

To monitor the market of elk, both national and international, and to make such information available to all members of the Association; to identify goals to be pursued toward expedition of national and international sales and transportation of elk; to pursue new markets for elk and elk related products, and to work toward the actual accomplishment of those priorities.

### MEMBERSHIP & EDUCATION

Richard Carmack  
Bob Johnson, Jr.  
Rush Johnson - CHAIRMAN  
Wilfe Jurke  
Dale Michel  
Dan Rodreick  
Lynn Stevens

To promote the growth of the Association through expansion of its membership roles; to encourage the continued participation of existing members, not allowing loss of interest; to develop tools (written and electronic) to assist in membership solicitation. To create in the public eye, both national and international, the best possible image of the Association and what it represents; to educate the public and potential members of the value of our industry to society and what impact as an alternate income source that it might have upon agriculture and to assist at seminars.

**Table 3. Estimated digestible energy (Mcal/kg) concentration of forages for dairy cattle based on the percentages of acid detergent fiber (ADF) and crude protein. All values are on a dry matter basis.**

ADF %	Crude Protein %22								
	6	8	10	12	14	16	18	20	22
24	2.79	2.80	2.80	2.81	2.82	2.83	2.84	2.84	2.85
26	2.78	2.79	2.80	2.81	2.82	2.82	2.83	2.83	2.84
28	2.77	2.78	2.78	2.79	2.80	2.81	2.81	2.82	2.83
30	2.74	2.75	2.76	2.77	2.77	2.78	2.79	2.80	2.80
32	2.70	2.71	2.72	2.72	2.73	2.74	2.75	2.76	2.76
34	2.65	2.66	2.67	2.68	2.69	2.69	2.70	2.71	2.72
36	2.60	2.61	2.61	2.62	2.63	2.64	2.65	2.65	2.66
38	2.53	2.54	2.55	2.56	2.57	2.57	2.58	2.59	2.60
40	2.46	2.47	2.48	2.49	2.49	2.50	2.51	2.52	2.52
42	2.38	2.39	2.40	2.41	2.42	2.42	2.43	2.44	2.45
44	2.30	2.31	2.31	2.32	2.33	2.34	2.35	2.35	2.36
46	2.21	2.22	2.22	2.23	2.24	2.25	2.25	2.26	2.27
48	2.11	2.12	2.13	2.13	2.14	2.15	2.16	2.16	2.17
50	2.01	2.02	2.03	2.03	2.04	2.05	2.06	2.07	2.07

indigestible it is, the longer feed is retained, the less room available for additional feed. As energy concentration of the diet increases, feed intake also increases until chemostatic mechanisms begin to limit intake (i.e., the point where the animal is able to eat enough food to satisfy its energy requirements). After this point, further increases in the energy concentration of the diet result in a decline in feed intake because less food is needed to satisfy energy requirements. Just as in humans, the chemostatic set point that balances energy intake with energy expenditure is not precise and can vary among individuals; in other words, elk can overeat and become overly fat.

In the wild, temperate cervids undergo an annual cycle of fat deposition and depletion. In deer, this cycle appears to be regulated to a large degree by photoperiod. White-tailed deer will reduce their feed intake and mobilize body fat during winter even though nutritious food may be abundant. Thus, getting fat and getting thin are obligate parts of the annual cycle. Data available for elk indicate they are less "locked" into this cycle. Although weight loss over the winter is normal for wild elk, it does not necessarily occur in captive elk if they have adequate food.

Equations for predicting feed intake by elk based on the energy concentration of the diet and energy requirements have not been determined; empirical estimates of feed intake must be used. To account for variability in body weight, dry matter intakes are often expressed as a percentage of body weight. Dry matter intakes recorded for elk generally range between 1.5 and 3.5% of body weight

(Table 4). Dry matter intakes as high as 4% of body weight have been reported in lactating females.

The following is an example of how information in Tables 1, 2, and 4 can be used to estimate the amount of concentrate that should be fed with free-choice forage. For a group of 12 month old heifer elk with an average weight of 300 lbs: (1) find the recommended DE concentration in the diet in Table 1 (2.6 Mcal DE/kg); (2) find the correct proportions of concentrate to forage in Table 2 to achieve 2.6 Mcal DE/kg in the diet (for this example we will assume that the concentrate contains 3.6 Mcal of 29% concentrate to 71% hay would yield 2.6 Mcal DE/kg in the diet); (3) estimate dry matter intake from Table 3 using 2.5% of body weight as average intake (7.5 lbs of dry matter or 8.3 lbs as fed); (4) calculate the amount of concentrate offered per animal in addition to free-choice hay (8.3 lbs X 0.29 = 2.4 lbs of concentrate per animal per day).

Although estimates of the amount of energy to provide in the diet can be useful, nothing can substitute for close observation of body condition to determine if the energy concentration of the diet is proper. Chute scales are very helpful for regular monitoring of body weight. Good records are one of the most useful tools in animal production.

The "hotter" the concentrate (i.e., the higher its DE concentration) the more control must be exercised over individual consumption to prevent overfeeding. Adding roughage to pelleted concentrates dilutes the concentration of DE and helps prevent problems associ-

ated with overconsumption of grain. This is especially useful in group feeding situations where individual feed intake is difficult to control.

I would not recommend feeding hays containing less than about 2.1 Mcal DE/kg to elk even when a concentrate is also fed. As a general rule, when a concentrate that does not contain roughage is fed, at least 50% of the diet should be forage.

## FIBER

Fiber is not considered a nutrient because it is not required at the metabolic level. However, fiber in the diet is important, especially for ruminants, to maintain a proper environment for rumen microbes and for proper functioning of the digestive tract. Fiber "requirements" and energy requirements are inversely related; one is essentially the flip side of the other. Too little fiber means too much energy and vice versa.

In addition to increasing the likelihood of overfeeding (i.e., energy excess), too little fiber in elk diets can result in acidosis, rumenitis, parakeratosis, and bloat. Acidosis occurs when large amounts of easily digested carbohydrate (e.g., grain) in the diet results in an overproduction of lactic acid by rumen microorganisms and subsequently a potentially fatal increase in body acid. Rumenitis and parakeratosis are less severe conditions wherein the rumen lining atrophies or develops abnormally because the pH of the rumen is chronically reduced by feeding too much grain. In each case, feeding large amounts of grain

reduced rumen pH, not only because fermentation rates are increased and there is a shift in fermentation pathways towards stronger acids, but also because less fiber results in less rumination which results in less saliva production. Saliva acts as a buffer to help maintain proper pH in the rumen. Buffers are often included in high concentrate diets for cattle (e.g., finishing feedlot rations, lactating dairy cow rations) to help maintain rumen pH. Feeding buffers to elk usually should not be necessary because diets very high in concentrates are seldom warranted. High grain diets can also cause an increase in the viscosity of rumen contents and subsequent foam produc-

tion. Currently, detergent methods provide the most useful, practical measure of fiber in ruminant diets. Neutral detergent fiber (NDF) closely approximates the plant cell wall and is comprised of cellulose, hemicellulose, lignin, and cutin. Acid detergent fiber (ADF) is similar to NDF except that it excludes hemicellulose. Cellulose and hemicellulose can be digested, to varying degrees, by rumen microorganism; lignin and cutin are indigestible. Generally speaking, hemicellulose is more digestible than cellulose; therefore, NDF digestibility is almost always higher than ADF digestibility. Lignin is a structural polymer that gives rigidity to higher plants

and is a fairly efficient at digesting grass cell walls given adequate time. Indeed, as cell wall thickness and NDF increase, rumen retention time also increases. Thus, grazing ruminants such as cattle are adapted to exploiting cell walls that are not highly protected by lignin. On the other hand, forbs and browse leaves usually have thinner cell walls, less NDF, and more cell contents than mature grasses. However, browse leaves, and to a much greater extent browse stems, are usually more lignified than grasses; therefore, browse cell walls are often poorly digestible. Thus, browsers such as deer and moose are more adapted to exploiting more easily digested cell

**Table 4. Typical feed intakes (dry matter basis) of elk.**

	Dry Matter Intake/day (% of Body Wt.)	Typical Body Weight (Lbs)	Dry Matter Intake/day (Lbs)
Calf (6 months)	2.5 - 3.0	220 (cow) 280 (bull)	5.5 - 6.6 7.0 - 8.4
Yearling (18 months)	2.0 - 2.5	350 (cow) 440 (bull)	7.0 - 8.8 8.8 - 11.0
Adult Maintenance 3+ years)	1.5 - 2.2	550 (cow) 800 (bull)	8.3 - 12.1 12.0 - 17.6
Late Gestation (24-36 weeks) & Early Lactation (0-6 weeks)	1.5 - 2.5	550	8.3 - 13.8
Mid - to Late Lactation (6-12 weeks)	2.5 - 3.5	550	13.8 - 19.3

tion. Excessive foam can inhibit eructation of methane and CO<sub>2</sub>, thus causing bloat. Grain bloat is often a chronic condition that usually is less severe than legume bloat (legume bloat commonly occurs in cattle and sheep grazing alfalfa or clover pastures).

Too much fiber also can have adverse effects. In addition to causing an energy deficit, too much fiber can potentially cause the lining of the rumen to erode, impaction, and twisted bowels.

Fiber basically refers to the cell wall constituents of plants that cannot be digested by higher animals. Fiber comes in different forms and different techniques for analyzing fiber measure different fractions. Crude fiber, a common but inconsistent measure of fiber, leaves much to be desired and has fallen out of favor by everyone except an entrenched feed

(e.g., stems, stalks, wood). Cutin is the waxy-like coating found on leaves, seeds and twigs. Lignin and cutin are not only indigestible by elk and their microbes, but they also reduce the digestibility of hemicellulose and cellulose by protecting these polysaccharides from microbial action.

Certain generalities that can be made regarding the fiber in different types of higher plants are useful for understanding the feeding strategies of elk and other ruminants. For example, the cell walls of grasses, which are usually low to moderate in lignin/cutin, become increasingly thick with maturity. This results in high NDF concentrations and little easily digested cell contents in mature grasses. Because the hemicellulose and cellulose in the cell walls of temperate grasses are generally not well protected by lignin, rumen microor-

ganisms are adapted to exploiting more easily digested cell contents rather than cell walls. The elk utilizes both strategies.

Elk maintained on pasture can often benefit by rotational grazing with cattle or horses. Pasture regrowth stimulated by cattle or horse grazing is lower in fiber and higher in DE than ungrazed, mature pasture.

In addition to maintaining proper digestive function, fiber is also occupational. As the NDF content of the diet increases, the time spent ruminating increasing (up to a maximum of about 8 hours per day). Elk typically spend about 4-8 hours per day ruminating. If long forage is not available in the diet, the time spent ruminating decreases; this time may be redirected towards vices such as hair chewing, cribbing, and pacing.

Some general guidelines for fiber concentrations in elk diets are given in Table 1.

# COPPER DEFICIENCY IN WAPITI

BY: SHARYON L. DOSHIER  
MANAGER, TIMBERLINE RANCH, LTD.  
CUSHING, OKLAHOMA

There is a mysterious malady that is killing elk. Some animals that have been afflicted, after having received what seemed to be the best of care, have simply died. The malady is Enzootic Ataxia, more commonly known as copper deficiency. Cases have been reported in New Zealand, Canada, the U.S. and virtually everywhere that elk are raised. As game farmers we need to educate ourselves on how to recognize it, how to treat it quickly should it occur, and more importantly, how to take steps to prevent it in our herds.

Studies show that elk are extremely susceptible to copper deficiency and indicate that elk require greater amounts of copper than other cervidae. The previous accepted rate of 10 ppm (set for cattle by the National Research Council) appears to be insufficient to meet the requirements of elk. More research is needed to determine what those levels may be, however, a safe assumption is a minimum of 15 ppm and in some instances may be as high as 40 ppm.

Elk can suffer from primary copper deficiency during times of inadequate copper intake, and secondary copper deficiency when copper intake is adequate but absorption and utilization by the body of the elk is inhibited.

Copper levels in plants do not always directly relate to copper levels found in the soil, and relying on copper levels in soil samples alone may be deceiving and potentially dangerous. Copper concentrations are greater in young, growing plants and decline with the age of the plant. Therefore, elk grazing pastures that are customarily copper sufficient may suffer from copper deficiency at certain times of the year because of the age of the plants. (Lowest levels are usually in mid to late winter and very early in the spring.) Applications of zinc fertilizer have shown to induce low copper levels in plants. Large amounts of iron and sulphur, as well as a high Ph level in the soil, can also lead to copper deficient plants. Increasing nitrogen levels in the soil lead to increased copper absorption by the plants. Legumes usually have a higher concentration of copper than grasses.

For copper to be utilized by the elk it must be capable of binding to a carrier protein in the gut which will carry it across the membrane where it may be utilized in the plasma. There are only a limited number of "carrier proteins"

available and copper competes with many other substances for these carrier positions. Copper can be bound up and rendered useless or remain in an unchelated form which is insoluble and can not be used by the body. In that event it may be passed off in the urine or feces without doing the animal any good. Copper competes directly with iron. Zinc and cadmium produce a reaction that "traps" copper and commits it to exit pathways via the urine. Sulphur also, or in conjunction with molybdenum, binds copper and renders it useless for absorption.

Pregnant cows have special needs for copper. Copper accumulates in large concentrations in the elk fetus. A cow needs .18 mg/day in addition to maintenance levels to meet the requirements of the fetus and colostrum production - elk colostrum contains 2.5 times more copper than the concentration in their milk. Lactating cows need .6 mg/day over and above maintenance for adequate milk production. Elk calves are born with very high copper reserves and in the absence of copper from any other source, these reserves may be adequate for up to 120 days. Calves require .7 mg of copper for each kilogram of weight that is gained.

Copper deficiency is a disease that primarily affects young animals (one to three years old) and pregnant cows. It is manifested by an uncoordinated, staggering gait, usually seen in the back legs first. Swayback, "dog sitting", general lack of condition and unthriftiness, hair loss, abnormal hoof growth, abnormal antler growth and infertility are also attributed

to copper deficiency. In later stages, it will cause massive weight loss, the animal is unable to stand, experiences severe trauma and eventual death. This is usually an unreversible condition. If caught in the early stages, damage to the nervous system may be halted, however; tissues that have already been damaged or destroyed can not be restored. Depending on the level of damage, treated animals can lead a normal life if caught early enough in the disease's progression.

Testing for copper deficiency in elk can be done by drawing blood and having the serum analyzed or at autopsy by taking liver samples. Blood serum levels of below 8.7 umol/L are deficient with levels under 2.5 umol/L being critically deficient. The animal is usually dead by the time blood serum levels reach this point. 12 umol/L is considered a normal range. Liver biopsy levels below 500 umol/kg are deficient with levels below 60 being critically deficient. Normal levels are 1400 to 8300 umol/kg. (If your lab report is given in ppm, the conversion is ppm 63.54 x 1000 = umol/K or umol/L).

Injectable copper is not a recommended treatment for elk - it provides no discernable relief and has produced massive tissue reactions and even death in some elk. Copper sulfate in the water supply has proven ineffective since elk will not drink the water. Inorganic copper chelate drenches have not been successful because orally administered copper is quickly cleared from the plasma by the liver and is in a form that can not be utilized by the liver.

Organic copper chelate drenches have been described as an effective treatment for elk, however, there is no established dosage for elk and they are very expensive and very hard to find in the U.S.

In New Zealand, the most effective treatment has been dosing with copper oxide or oxidized copper wire particles contained in a gelatin capsule that provides a "time release" action that lasts up to 9 months. This product is called "Copporal" and is marketed by Beecham, however, it is not licensed for use or available in the U.S. Powdered chelated copper has been used effectively when top dressed over feed at twice the recommended rate for cattle,

however, chelated minerals are very expensive and quite difficult to obtain in the U.S. Other commercial supplements used in the cattle industry can possibly be effective if your elk will eat them. I have been informed that Vita Firm CC5 has been used with some degree of success.

As in most successful animal husbandry situations, the best way to deal with copper deficiency is to prevent it from ever happening. You should give high priority to copper requirements as you plan your nutritional program.

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## LETTER FROM THE PAST PRESIDENT

Dear Members:

As your Past President, I respect the Board of Directors recent action taken at the meeting in Moberly, MO.

In our great country, majority rules. While all do not always agree on every issue, each must respect other individual's thoughts, **BUT ALWAYS THINK FIRST OF OUR ASSOCIATION**, allowing it to continue to move ahead without interruption.

Let me say, my love for elk, as well as our Association, will not allow me to think otherwise.

I am anxiously looking forward to working with the Executive Committee as well as serving as Chairman of the Membership Committee for the ensuing year.

Sincerely,

RUSH JOHNSON

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and any adjustments are necessary. (See block B for 1990/1991 calf crop weights.)

The feeding program we use for calves begins 2 weeks before weaning when they are given an 8-way blackleg vaccine which includes chloristridium which guards against overeating and we put a creep feeder filled with a small amount of oats and corn in their pasture. After weaning they are started on a ration of 1/2 "receiving pellets" similar to those used at cattle feedlots, 1/4 whole oats and 1/4 of our special formulated pellets with free choice alfalfa hay. This ration gets them started on feed without fear of them becoming toxic before the rumen becomes adjusted to grain. They are gradually switched to a ration of 1/3 of our pellets, 1/3 whole corn and 1/3 whole oats with free choice alfalfa which they are kept on until 15 months old. They are fed twice a day and given as much as they will clean up in one feeding. This program has produced spectacular results for us.

At Timberline Ranch we chose a 3/8" pellet as the base for all of our rations because they are economical in our area, easily obtained, readily available, easy to store and handle and most important, they assure us that the elk are getting everything they need in a form that they find palatable. You can put ingredients in pellets that elk would never directly eat on their own yet are readily consumed in pelleted form. If custom mixed cubes are an option in your area, I would take the dietary recommendations to the feed mill and tell them to mix a cube that would satisfy those levels using whatever ingredients that are readily available and most economical in your area. I prefer an alfalfa based cube with a lot of corn in it but if the nutrients are there it really doesn't matter what ingredients you use as long as you satisfy the requirements.

For those of you who do not wish to go with pellets, a good simple ration that will meet all the maintenance needs for adults is 13 lbs. alfalfa hay, 1 1/2 lbs. oats and 1 lb. corn per head per day along with a free choice vitamin/mineral supplement. Calves would receive 10 lbs. alfalfa hay, 2 lbs. oats and 1 1/2 lbs. corn with a free choice vitamin/mineral supplement.

For those of you formulating your own formula, a good rule of thumb is 2.2 lbs. dry matter per 88 lbs. of body weight per day with at least 11% protein and 65% carbohydrates. For comparison, oats are 88% dry matter, 11% protein, 64% carbohydrates, 1.0 calcium and 3.1 phosphorus while corn is 87% dry matter, 9% protein, 74% carbohydrates, .3 calcium

and 2.8 phosphorus.

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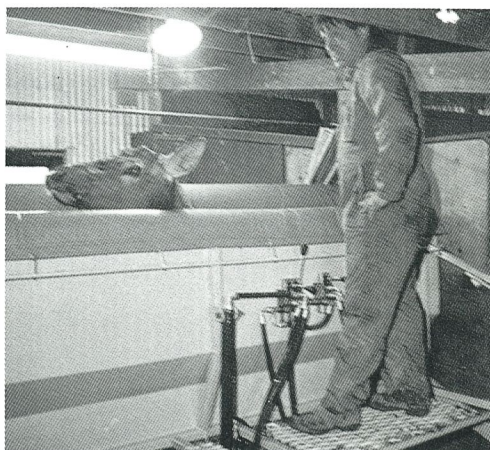
*Editor's Note: Sharrie Doshier is a dynamic young woman who has managed Timberline Ranch located near Cushing, Oklahoma since 1984. Although elk have been raised on the ranch for over 17 years with long standing goals of excellence through selective breeding, dramatic improvements have been made in the overall size and quality of Timberline Ranch elk under Ms. Doshier's management. When we heard her speak to the Colorado Elk and Game Growers Association on nutrition we knew her success was no accident. It is with this recognition that we have asked Sharrie to share some of her secrets.*

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With the exception of young calves, at least 20-25% ADF is recommended in elk diets. With the possible exception of adult maintenance diets, ADF should not exceed 40-45% of the diet dry matter.

### PROTEIN

Next to water, protein is the nutrient required in the greatest amount by elk and generally the most expensive nutrient to provide in the diet. Protein deficiencies can occur in captive elk because many forages and common feeds are inadequate in this nutrient. Too little protein can result in weight loss, impaired growth and reproduction, decreased birth weight, reduced milk production, reduced antler size, and dull, rough pelage. In some ways, the protein nutrition of elk is simplified because functional ruminants, unlike simple stomached animals, do not have a dietary requirement for specific amino acids, the building blocks of protein.

Crude protein (CP) concentrations I would recommend for elk diets are given in Table 1. Protein requirements of elk are determined by protein digestibility, the efficiency of utilizing absorbed protein, the amount of body protein lost in the feces and urine, and the amount of protein deposited in gain, conceptus, milk, hair, and antlers. True protein digestibility by elk and other ruminants is generally 90% or greater when interfering factors such as phenolics are not present in the diet. Although phenolics can significantly reduce protein digestibility in some browses and forbs, they are negligible in common feed-stuffs used in captive elk diets. Absorbed protein is used with decreasing efficiency as protein intake increases above maintenance. At the point where protein intake equals maintenance needs, efficiency approaches 100%. The efficiency of using absorbed protein for tissue or milk production averages about 66% in domestic ruminants.

Studies at Washington State University have shown that elk require at least 3.5% protein in the diet just to meet their protein cost of eating (i.e., to compensate for protein of body or microbial origin lost

in the feces as a result of digestion). In addition to protein losses in the feces, protein is continually lost in the urine, mainly in the form of urea, due to the turnover of body protein. In elk, this minimum "idling" loss via the urine is equivalent to about 1 gram of protein/day for each kg0.75 of body weight. By adding minimum fecal losses to minimum urinary losses and correcting for 90% protein digestibility, it can be calculated that a 500 lb. elk consuming 1.5% of its body weight in dry matter per day would require at least 5.8% crude protein to meet minimum maintenance needs exclusive of hair and scurf losses.

Similar to energy, protein deposition in the conceptus occurs primarily during the last trimester of gestation; very little occurs during the first trimester. Therefore, providing adequate protein above maintenance is most important after about the 24th week of gestation.

Elk milk averages about 6.2% protein. At peak lactation, a cow elk loses over a half pound of protein per day in her milk. Assuming absorbed protein is used with 66% efficiency for milk production, a 500 lb cow consuming 2.5% of her body weight in dry matter per day would require at least 7.5% protein in the diet just to compensate for protein lost in her milk. This added to her maintenance protein requirement, results in a total requirement of about 13% CP in the diet.

Although protein is a major component

of the diet and a protein deficiency can restrict antler growth, the needs for protein in excess of maintenance requirements to support maximum antler growth appears to be very small. For example, an 800 lb. bull producing 30 lbs. of hardened antlers (35% protein, as is basis) over a 150 day period would deposit an average of 32 grams or protein/day into its antlers. Assuming dry matter intake averages 12 lbs per day (1.5% of body weight) and dietary protein is used with 60% efficiency for antler production, less than 1% additional protein would be required in the diet to support antler production (i.e., 5.6% for maintenance + 1% for antler production = 6.6% minimum protein in the diet).

The protein content of forages declines with increasing maturity. Mature grass hays often contain only 4-6% crude protein. Weathered range grasses during winter can contain as little as 2-4% crude protein. Legume forages are generally good sources of protein. For example, early bloom alfalfa typically contains 17-19% CP. Thus, a good quality alfalfa hay can satisfy the protein requirements of all types of elk with the possible exception of calves up to 6 months of age.

When forages contain inadequate protein, additional protein must be provided by a concentrate or protein supplement. Whole grains range in protein from about 9 to 13%. While a concentrate consisting only of grain, fed in combination with forage, sometimes

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provides adequate protein for ~~adult~~ elk, additional protein sources are often necessary, especially if grass hay is used, for growing calves and yearlings, and for lactating females. Oilseed meals (especially soybean meal) are commonly used to increase the protein content of concentrates for ruminants. In addition, feeds such as alfalfa meal, alfalfa pellets, and corn gluten meal can be used. Protein blocks and liquid protein supplements (fed using a lick wheel) that are commercially

available for beef cattle, can be used for elk on pasture.

Non-protein nitrogen (NPN) sources (usually urea) are often used in cattle and sheep diets to reduce feeding costs. Utilization of NPN for protein synthesis by rumen microorganisms reduces the need for more expensive intact protein in the diet. It should also be possible to utilize NPN supplements to some extent for elk. However, care must be taken because excess NPN can result in

ammonia toxicity, especially if the diet is low in energy. For cattle and sheep, it is generally recommended that urea concentrations in the diet should not exceed one-third of the total protein or 1% of the total dry matter. NPN sources are not recommended (1) when diets low in energy (e.g., < 2.3 mcal DE/kg of dry matter for maintenance diets) or high in intact protein are fed, (2) for calves, or (3) for animals in poor condition. If used, NPN sources should be introduced into the diet gradually.



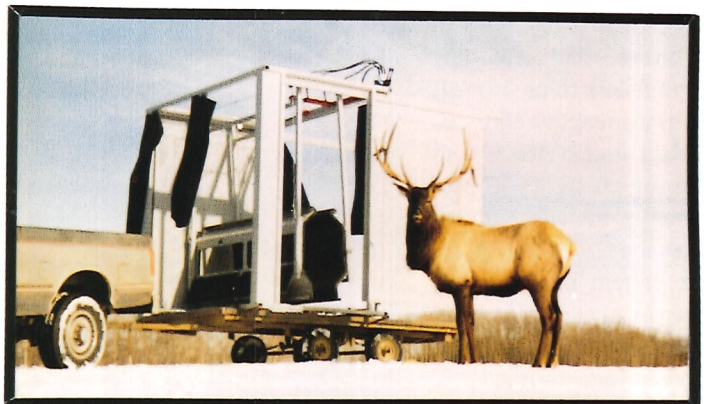
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3-54

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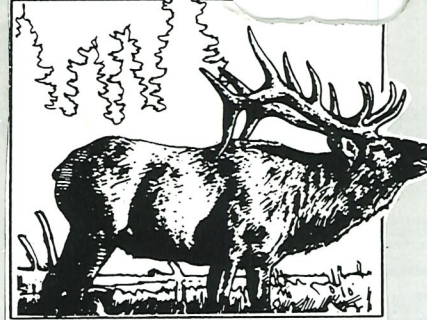
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PHONE (Residence) \_\_\_\_\_ PHONE (Office) \_\_\_\_\_  
FAX # \_\_\_\_\_ TOLL FREE \_\_\_\_\_  
Number of elk on hand \_\_\_\_\_ Number of other hoofed species \_\_\_\_\_

### MEMBERSHIP CATEGORY (Check membership desired)

- \_\_\_\_\_ \$2,000 Life Member - (Full voting rights, must own elk)
- \_\_\_\_\_ \$ 300 Corporate Member - (Supporting membership - no voting rights)
- \_\_\_\_\_ \$ 150 Active Member - (Full voting rights - must own elk.)
- \_\_\_\_\_ \$ 150 Int'l Associate Member - (Reside outside North America, no voting rights, need not own elk. Add \$10.00 for shipping.)
- \_\_\_\_\_ \$ 75 Associate Member - (No voting rights - not open to elk owners.)

Method of payment:  Check  Visa/MasterCard  American Express **PAYMENT IN U.S. FUNDS ONLY**  
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- \_\_\_\_\_ \$ 150 Active Member - (Full voting rights - must own elk.)
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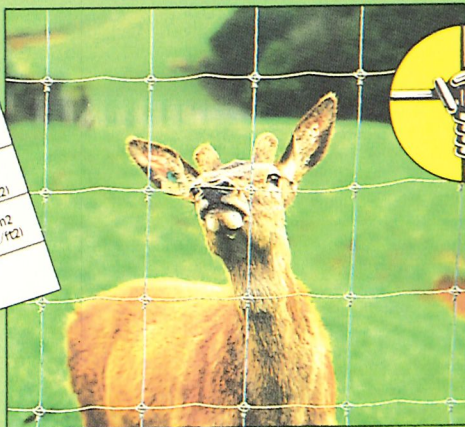


Elk Bull

WIRE QUALITY SPECIFICATIONS				
	Wire Strength	Minimum Tensile	Conv. Weights (Zinc coating)	
			Minimum	Mean
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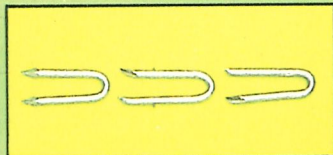


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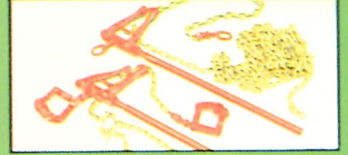
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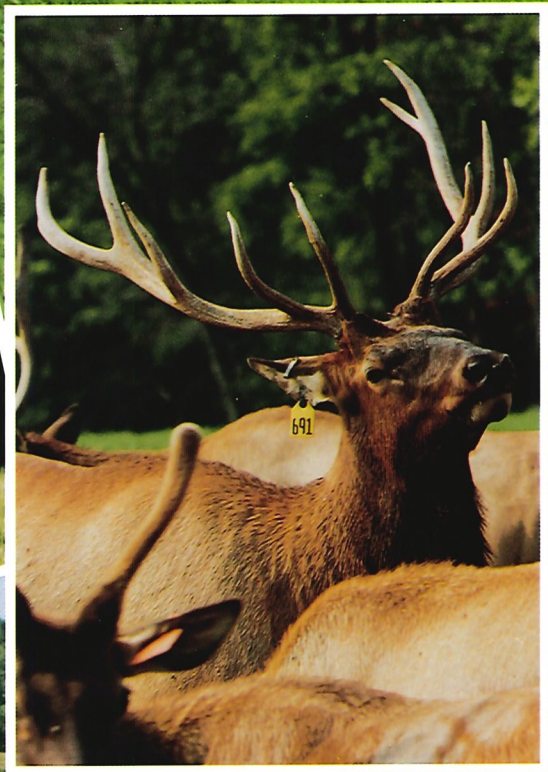
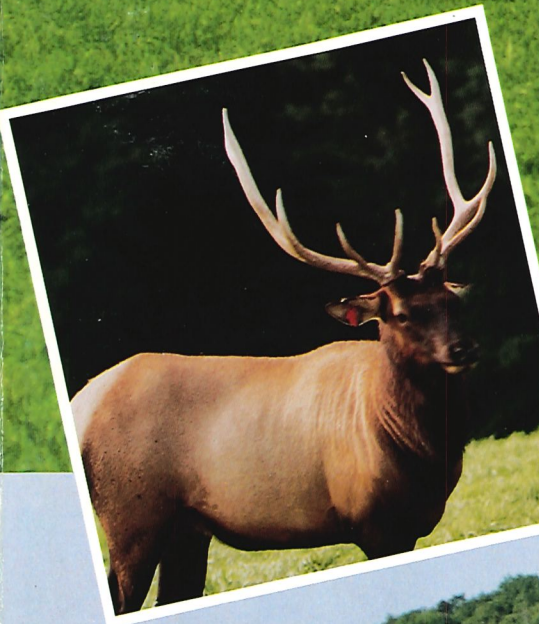
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Winter 1993



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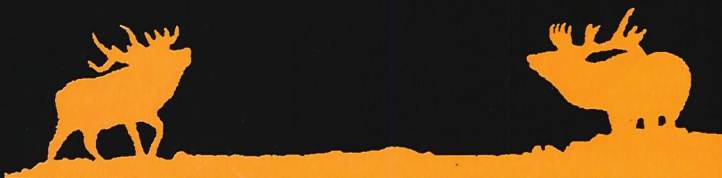
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**PRESIDENT'S MESSAGE**

I am writing this letter from Ft. Worth, Texas where we are preparing for the Fall Satellite Video Auction. We owe a special thanks to the sponsors and consignors that have supported this event. A survey of the vast majority of those in our industry report that they have sold all of the animals that they wish to sell this year and I am personally aware that many consignors have consigned animals solely to help our Association. Another special thank you to our Texas, Oklahoma and Louisiana Chapter (South Central Elk Breeders Association) for hosting the auction. Their local help has made all of the difference. There has been no other NAEBA activity that has been more successful in "showcasing" our industry to all of North America than the satellite video auctions. The exposure that our industry has received has been much more important than the actual service of selling the animals.



*Sam Withiam, President*

I was privileged to attend the annual meeting of the U.S. Animal Health Association (USAHA) held in Louisville, Kentucky in early November. The fine reception which NAEBA received from the members of that organization (comprising both State and federal animal health regulatory agencies, industry representatives such as the National Cattlemen's Association, the National Dairymen's Association, the Farm Bureau, etc.) made me acutely aware of just how far NAEBA has come. In less than 3 years this Association has grown from the twinkle in the eyes of 36 Founding Directors to being officially recognized by this august body (USAHA) as the true representative of the elk industry. We must have this kind of recognition if we are to be an effective voice. As State and Federal Governments adapt their regulations and procedures to include cervidae, we must have a voice in that process. I am most proud to tell you that we do. I am pleased to announce that NADeFA (North American Deer Farmers) has committed themselves to support our efforts to obtain legislative authority for a TB indemnification program. This support was embodied in a joint resolution of NAEBA and NADeFA which was adopted and approved by USAHA itself. As you know, this organization largely establishes the animal health priorities for USDA and this resolution will provide a tremendous boost for our legislative efforts.

In this, my last President's Letter, since we will be electing new Directors and Officers at the Convention in South Padre, I want you to know that the State of your Association is financially sound, membership continues to grow, the registration program is expanding in leaps and bounds, and above all, we have a truly professional office staff in Kansas City providing quality and consistent supervision of our Association activities.

Early Convention projections indicate that this will be a well attended event and I can assure you that it will be lots of fun! (Walking on the beach in February sounds good to me!) Please plan to attend. Anybody who has attended our

*Continued on page 27*

The *North American Elk* is the Quarterly Journal of NAEBA and serves as a forum to promote the elk ranching industry by educating the members and general public in proper management and breeding practices. It is the philosophy of this Association to share the fantastic rewards of its members with diversification through elk ranching as a futuristic and profitable industry. The North American Elk Breeders Association, Inc. is a non-profit organization incorporated in that state of Colorado on April 12, 1990. The Quarterly Journal is the official publication of NAEBA. All rights reserved.

6-y

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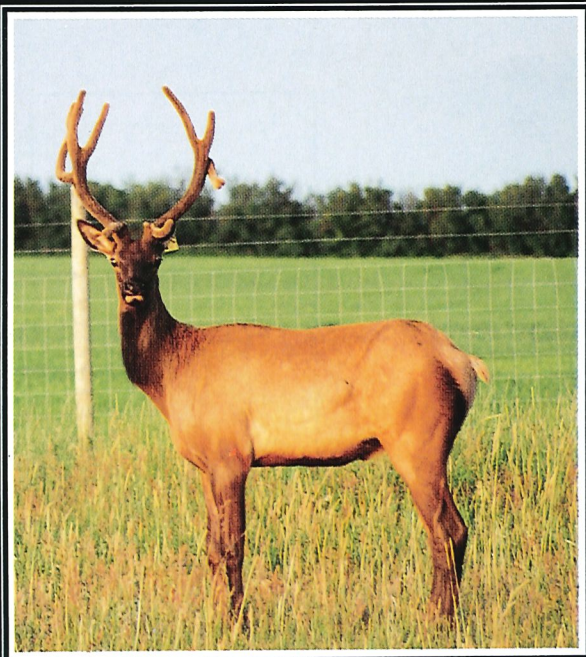
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# NORTH AMERICAN ELK

Winter 1993

Quarterly Journal of the North American Elk Breeders Association

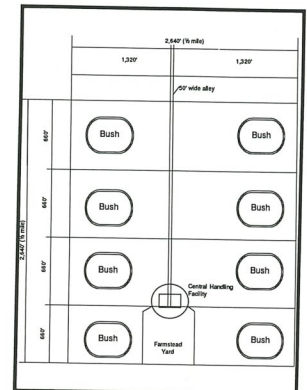
Volume 3, Number 1

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Page 14

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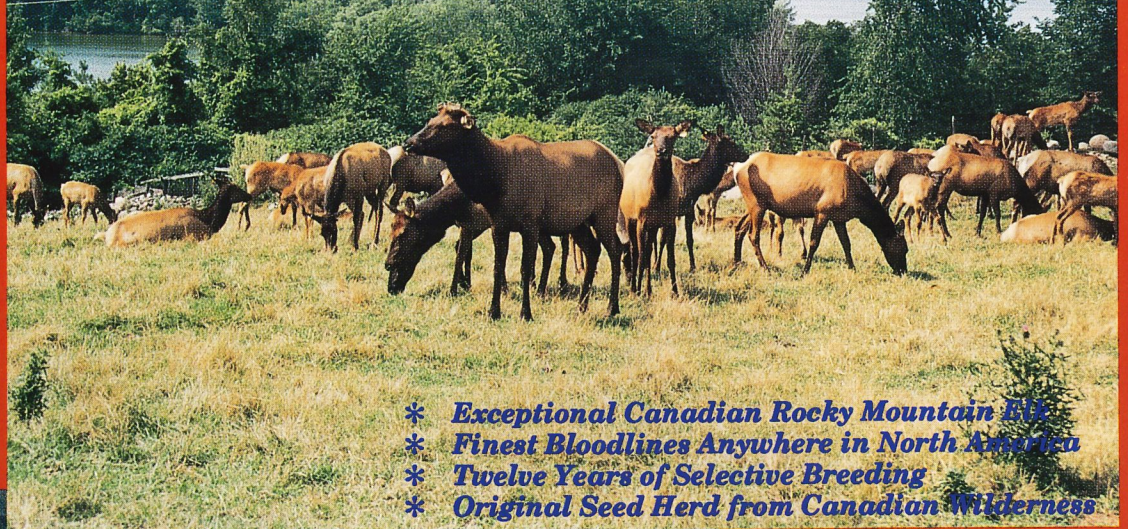
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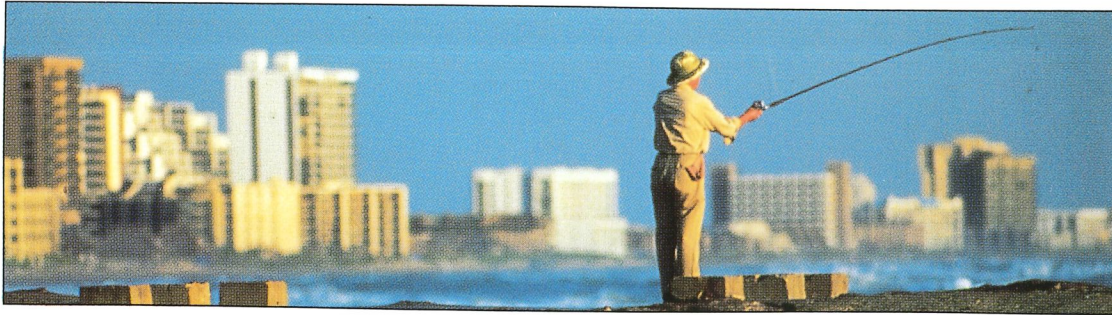
Dean & Heidi  
Rt. 1, Box 119A  
Zumbro Falls, MN 55991  
507/753-2862

65



# South Padre Island

The Site of the 3rd Annual NAEBA Convention



February  
3-7  
1993

*Bring an Elk enthusiast friend and join the fun in the sun and five super packed informative days regarding Elk handling facilities, meat marketing, record management systems, herd registration, herd health and nutrition, public relations in industry and investment financing to name just a few.*

## Convention Schedule

### Wednesday, February 3

- 1:00 p.m. Exhibitor Set up
- Orientation for invited local organizations at convention center
- 1:00 - 8 p.m. Registration at Sheraton Hotel
- 5:30 p.m. NAEBA welcome to the Island Reception at poolside overlooking gulf at Sheraton Hotel
- 9:00 - 10:00 p.m. Drawing of Directors names to retire from board

### Thursday, February 4

- Breakfast on your own
- Exhibits open all day
- 8:00 - 9:30 a.m. Registration at Convention Center
- 9:30 - 10:30 a.m. Opening ceremonies, Great Hall, Convention Center
- 10:30 - 11:00 a.m. Coffee break in Exhibit Area
- 11:00 a.m. - Noon Regional meetings in meeting rooms at Convention Center/voting for new regional directors
- Noon - 1:30 p.m. Luncheon, Great Hall, Convention Center
- 2:00 - 3:00 p.m. I Seminar - **Handling Facilities** - Panel Discussions by Industry Experts
- II Seminar - **Meat Marketing Present and Future**
- 3:00 - 3:30 p.m. Coffee Break in Exhibit Area

- 3:30 - 5:00 p.m. III Seminar - Record and Management Systems
- IV Seminar - Herd Registration
- 5:00 - 6:00 p.m. Open cash bar and free hors d'oeuvres in foyer of Convention Center Viewing Exhibits
- 7:00 - 8:00 p.m. Directors meeting - Election of New Executive Board

### Friday, February 5

- Breakfast on your own
- Exhibits open all day
- 8:30 - 10:30 a.m. General membership meeting, Great Hall, Convention Center with update on NAEBA with reports from Committee Chairmen
- 10:30 - 11:30 a.m. Coffee Break in Exhibit Area
- 11:00 a.m. - Noon V Seminar - **State Agricultural Panel Discussion**
- VI Seminar - **Advanced Herd Health and Nutrition**



# The Brightest ☆ on the Texas Coast

Noon - 1:30 p.m. Luncheon, Great Hall, Convention Center



Ladies luncheon at Sheraton Hotel with fashion show featuring fashions from Mexico (optional - reservations required)

2:00 - 3:30 p.m. VII Seminar - **Basic Financing of Elk Ranching**

VIII Seminar - **Public Relations in the Elk Industry: What the Industry has to Portray**

Free Time  
Exhibit Viewing

4:00 - 5:00 p.m. Seminar IX - **Velveting: How to and Why**

6:00 p.m. Cocktails, cash bar at Convention Center

7:00 p.m. Texas barbecue served buffet style, Great Hall, Convention Center Introduction of New Executive Board and Regional Directors

8:00 - 10:30 p.m. Benefit Auction  
(Small items to be sold in silent auction with bids taken until 4:30 p.m., then sealed bids taken until 5 p.m.)  
Room at Convention Center



Noon - 1:30 p.m. Luncheon Great Hall, Convention Center

1:00 - 6:00 p.m. Exhibits open to the public

2:00 - 3:00 p.m. XII Seminar - **Velveting - The Future**

6:30 p.m. Banquet, Convention Center  
Announcement of New Officers  
Big Blow Out Night!  
Awards Presentation  
Drawing for Starter Kit

## Saturday, February 6

Breakfast on your own

Exhibits open all day

8:00 - 9:00 a.m. Executive Board Meeting

9:00 - 10:00 a.m. Regional Meetings

10:15 - 11:30 a.m. X Seminar - **Basic Animal Health and Nutrition**

XI Seminar - **Investment Financing in the Elk Industry**

## Sunday, February 7

Exhibit tear down

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*Photos courtesy of South Padre Island Convention & Visitors Bureau.*

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6-16

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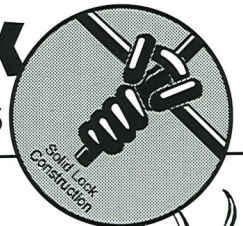
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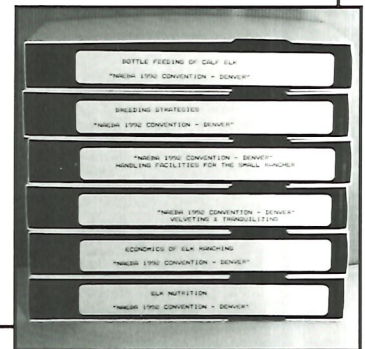


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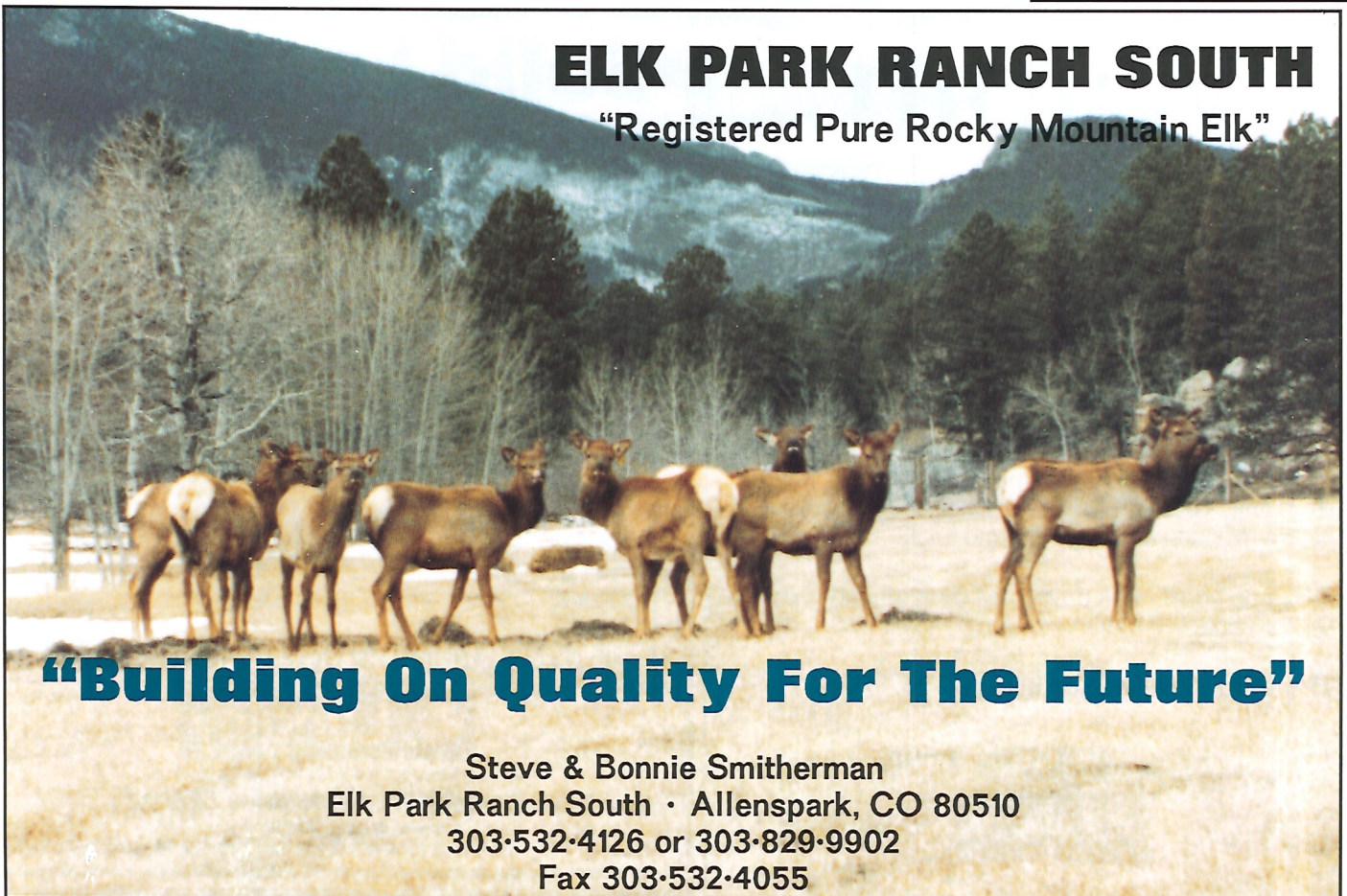
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## Wade Hainstock

Wade Hainstock purchased his first elk in 1981 and has been president of the Canadian Elk and Bison Trading Company since 1985. Wade has been involved in the organizational aspect of game farming since its inception in Canada. He is a past President of the Saskatchewan Game Farmers Association and has also served as their Secretary and Treasurer. Wade was a founding member of the Canadian Game Farmers Association and the Saskatchewan Game Farmers Association.

Wade has been very instrumental in lobbying efforts in both Provincial and Federal Canadian Governments. Wade has worked with elected and appointed officials and bureaucrats to build strong relations between game farmers and government agencies. He has been very successful in educating government about the benefits of game farming and establishing a positive image of the game farming industry.

He has organized forums to inform members and provide a place to exchange ideas in a learning environment as well as making presentations at livestock and agriculture shows that educate the public about the positive aspects of game farming.

Wade taught high school for 15 years before becoming involved in game farming on a full time basis. He is a graduate of the University of Saskatchewan. Wade is married and has three children.

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# Who's Handling Who?

by John W. Carson  
Big Island Ranch Ltd.

There is no excuse for not having a working handling facility if you plan to be profitable and stay in the elk business. As compulsory government disease testing becomes most stringent and purchasers become more demanding, the need for a good handling facility is greater than ever. I have seen and used both simple and elaborate systems, and fancy or expensive need not be the answer to your handling requirements. I am on my fourth handling facility and hope to give you enough information and ideas so that you might better design your own facility and not make the mistakes that I have.

The following are a few things you should take into consideration about elk when designing your facility.

A) Elk are a herd animal and will panic when separated from the rest of the group. Like geese, trying to separate one animal from the herd in a field situation is almost impossible. They have one thing on their mind, and that is to get back to the flock. This herd instinct can be used to your advantage.

B) When an elk is born, its only means of defence is to hide. Elk, being one of the stronger members of the deer family, when pressured, first try to escape, second, try to fight, and third, will resort to its fetal instinct and hide. These responses must be remembered when designing your facility. Depending on how frightened an individual animal is will determine whether it will run, fight or hide and a good facility will facilitate all three responses. The worst response for both you and the elk is when they hide or lay down. This third stress level should be taken as a warning, and is usually more prevalent in wilder herds. If possible, more hand feeding and the introduction of a few tame animals in the herd will more than pay for themselves. It is my

belief that elk are best handled when they are in the fighting frame of mind. If they are trying, or able to escape, you do not have them under control. If they are laying down, their stress level is too high and the possibility of complications and of being stepped on and injured by other animals arise. So remember that handling elk is always a fight, and a good handling facility is the equalizer.

Some specifics that you should keep in mind when designing your handling facility are:

A) The handling facility starts at your outside perimeter fence. Fields and runways should be set up so that the herd can escape from you. The situation where your animals pass through your crowding, or even handling area, at their leisure on a normal and regular basis for food and water is ideal.

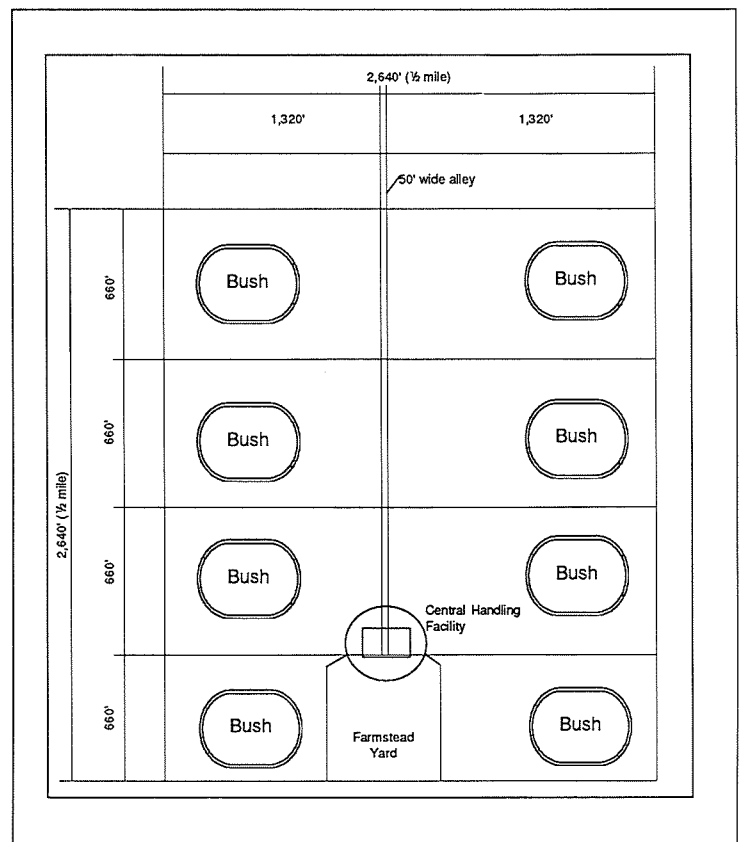
B) Dark is better than bright, so a roof and enclosed walls is preferable. A building also makes life much nicer for you on cold or rainy days.

C) The walls of your crowding area should be ten feet high and constructed of wood. Although elk are not great jumpers in comparison to deer, they may try to scale

a wall less than ten feet and possibly hurt themselves. It has been my experience that elk won't even think of jumping a wall of this height.

D) Your crowding and handling area must be free of all protrusions and cracks. An elk, while trying to escape, will run into the most unlikely things. Interior posts, watering bowls, feed troughs, and a host of seemingly harmless items have been the cause of broken legs and other injuries. The spacing between planks should be small enough so that legs cannot be poked through.

E) The size of your handling facility is determined by the number of animals that



Drawing #1 — Field Layout

you may wish to handle at one time, and not by the number that you expect to be raising. It is also handy to have two or three pens in your crowding area to break up a herd into smaller groups. Too large a crowding area can cause grief as well. Although extra help is required when handling your elk, it is ideal to be able to move your herd from the crowding area to your handling facility by yourself. Your herd is used to you, and the fewer strangers at this time, the better.

If there is one trait that is common when handling elk, it is their resistance to pass through a gate. I have witnessed individual elk take as long as 30 minutes building up courage to pass from one field to another. This was a situation where the elk could see through the fence and see the entire area to which she was trying to go, but that invisible barrier is still there.

My third, and most elaborate handling facility, was patterned after the New Zealand system, the circle pen with a series of pens around it to hold groups of animals. This system was designed to handle red deer, and works reasonably well. However, you have a situation where you are forcing elk to pass from one pen to another through a gate. This forcing an individual animal through a gate usually ends up with a great deal of resistance and persuasion is required to accomplish the task. As well, it is likely that you will end up with a "bottle neck" when moving a group. When one goes, everybody goes, thus an area for injury. With the circle, I usually ended up in the pen with the elk and my piece of plywood. After having too many close calls, and my plywood getting smaller and smaller, I went back to the drawing board.

As I have already stated, your handling facility starts at your perimeter fencing. I am including a drawing of a possible field layout that should be considered. The mistake that I made was to first build my perimeter fence and then added interior fences as my herd grew and the necessity for pasture rotation increased. I recommend starting with smaller fields and adding on as required. These smaller fields will tame

your animals better. I realize that the bush areas shown never end up where one would like, but if you do have treed areas on your farm, leave as much bush as possible. A dugout or watering bowl is required in each pen as well. As elk love water, a dugout in each pen will provide a great deal of enjoyment for both you and your elk. Depending on your land quality and grass production per acre, a pasture arrangement like this could easily handle 100 adult elk. Eight pens arranged as such allows for good pasture rotation and for four breeding pens with proper separation of the bulls during rut.

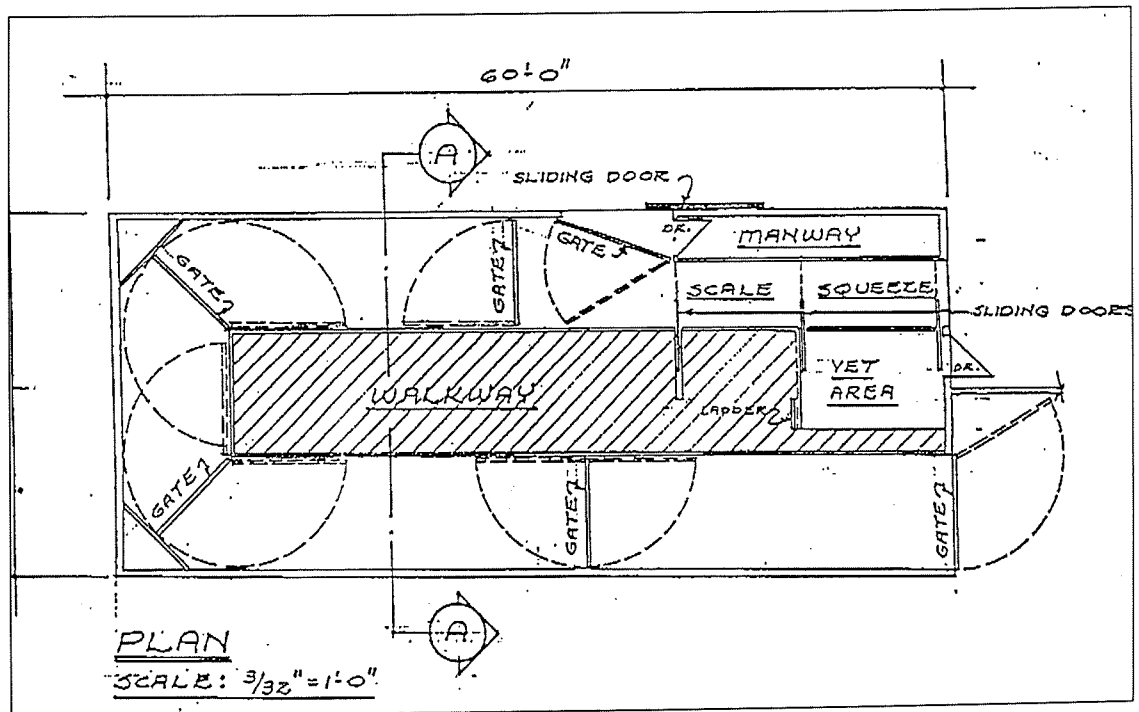
The crowding area around the handling facility should be constructed of wood and be 10 feet high, with large pens on each end that can be used to hold the animals prior to handling. The area should be used for feeding to familiarize your elk with the area and reduce stress when working them. I also use this area to wean our calves.

Our present, and hopefully last, handling facility is somewhat like drawing #2. We used our existing 40 x 60 ft. building with existing exterior doors and crowding area, thus ending up with an "L" shaped interior with the animals entering one end of the building and leaving through the other. Although this "U" shaped configuration will work very successfully, any desired design or length could be used. The secret, I believe, is keeping the handler in the center and the animals on the outside, as opposed to having the animals at the

bottom and the handler up above, as is the case with the circle system. After using both systems on the same animals, it is my observation that our present system allows for much quicker, and less stressful handling for both myself, and my herd.

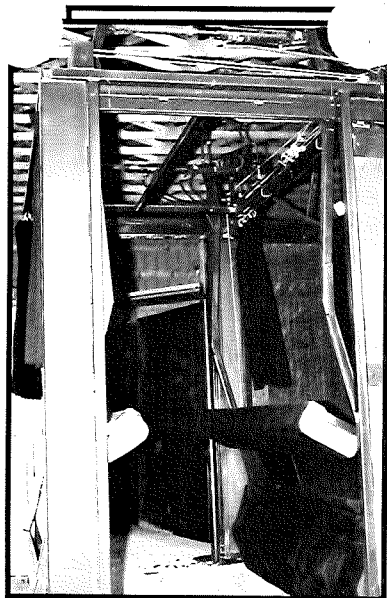
I constructed our handling system using 2 x 2 inch x 1/8 inch square tubing with 3/16 x 3 inch flat bar to hold 2 x 8 inch by 8 foot upright planks. This type of construction is very quick and cost effective. As well, the finished product is free of any protrusions or sharp edges. Your building is self-supporting and no poles need be augered in first.

In conclusion, it is my hope some of these ideas will be of use to you and your elk, and as we all share ideas and experiences, our management and industry will improve. The drawings included in this article are for the purpose of showing an alternative type of design and should not be considered as a blueprint for construction. There is one piece of advice that I would like to pass on. Build your handling system on paper before you start with wood and steel. Design your system, and then show it to people with elk handling experience for their comments and suggestions. An eraser is much easier and cheaper than a cutting torch. I would be very interested in hearing from you with your comments, questions and improvements so that I could also learn more and pass this on to others.



Drawing #2







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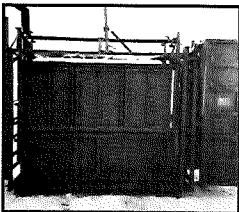



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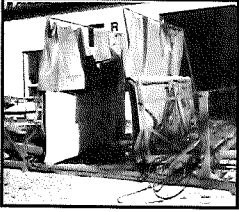
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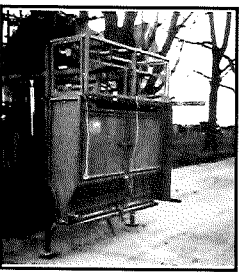
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6-18

# Elk Breeder Survey Part III

## A Culmination of 258 Years of Experience

by: Melinda Huszti

The following is a continuation of the survey which we began running in the Summer issue.

### ROY COPITHORNE

Jumping Pond Wapiti is located 20 miles west of Calgary. Currently at 60 head of elk, they plan to specialize in breeding stock.

### DIRK HARDMAN, KEN NEBENZAHL

Lone Cone Ranch in Norwood, Colorado has 71 head of elk and specialize in breeding stock.

### RAY MATEJCEK

The Matejcek Game Farm in Owatonna, Minnesota currently has 45 elk. The farm specializes in Rocky Mountain Elk, white tail and mule deer.

### BRIAN MACCARTY

The NX Bar Ranch in Sheridan, Wyoming has approximately 300 to 350 elk. The ranch is a hunting operation, which also produces brood stock.

### JOHN MUMEY

Dr. Mumey's farm in Muldrow, Oklahoma has 41 elk that he is raising as a long term investment.

### STEVE MUSICK

The Judith River Ranch in Hilger, Montana raises elk, mule deer, white tail and pronghorn for propagation and hunting.

*When purchasing elk, newcomers to the business are often unsure about what characteristics are most valuable. In each of these four categories (herd sire, producing cow, velvetting bull and 5-month-old calf) which of the following items is most important to you?*

*Conformation, disposition, weight, size, progeny, registration, pedigree, antler development (weight, symmetry or size), breeders reputation, age, price or other?*

**ROY: Herd Sire** - We are going to specialize in breeding stock, so any bulls we choose would have to be above average in antler production, body size and conformation. It seems elk bulls keep growing all their adult lives. A five-year-old bull tells you exactly what he is going to do. A three-year-old bull gives you an excellent indication of what he is going to do. **Velvetting Bull** - One that has an ability to eat grass and breathe. **Producing Cow** - I like my cows big. Big elk are hard to find. You can't know if they are going to be good mothers, although most elk tend to be good mothers. They are close enough to the wild that the bad mother's offspring didn't survive. **Weanling Calf** - It is most obvious that a breeder will sell you better calves than he will producing cows. With the cows you have a chance to get a calf every year, but with a calf you are looking at a three year return on your investment. Buying calves is the fastest way to improve your herd, but is the slowest way to get growth on your herd. If you are buying a weanling calf, look at the breeder's cows and at the bulls he is using. I would look at his calving dates. Thirty days is the difference between the calf born on the 1st of June and the calf born on the 1st of July. But on the ground in October, it looks like there is a half a year's difference. But they grow fast and that difference is recovered quickly.

**DIRK: Herd Sire** - Conformation, first of all, and I think you would have a pretty good idea of that when the bull is two-years-old. Disposition is also real important. You don't want a bull you can't handle, no matter what kind of conformation. You also need a significant amount of antler growth for a herd sire. **Velvetting Bull** - Antler. Ideally, you need to look at him at a few different ages. **Producing Cow** - In a three to four-year-old cow, I would be looking for conformation and disposition. To me conformation means weight, size and how she is put together. **Weanling Calf** - One of the important things at 5 months of age is their size compared to the rest of the calves in the bunch. The bigger animals are going to be the ones who will reproduce at two-years-old which is an added benefit.

**KEN: Velvetting Bull** - Probably, at two years you would have a good idea and at three years you should make your decision. **Weanling Calf** - In buying heifer calves we are interested in blood lines as well. Also the breeder's reputation is very important. The breeder's reputation and blood lines converge at this point because the seller got his reputation by building a quality herd.

**RAY: Herd Sire** - When I started raising elk, I was primarily trying to sell trophy bulls to shooting ranches. Because of this, antlers were 99% of what we were trying to breed.

It seemed the big bodied animal did have the big antlers as he matured, but not always as a young animal. Extremely good production as a spike does not necessarily indicate how that animal will turn out later. You almost have to wait for an animal to mature to know what he's going to produce. I've found that an animal needs to be about six-years-old to really show his potential. **Velvetting Bull** - Heavy bases. I look for really thick bases, so that they will weigh up good. **Producing Cow** - Size seems to be the thing that everyone looks for in animals and it is always nice to have big animals. We like the large boned, tall and long animals. **Weanling Calf** - I think the pedigree is extremely important. We've always looked back to the bull that anything comes from. We were looking for antler development there. Whatever you're raising, you need the sire of your females to have been an exceptional animal.

**BRIAN: Herd Sire** - It would depend on your long term outlook. I look for length of brow tines clear through your main beam and weight. For a trophy animal you are looking for a bull 8- to 10-years old. I might add that we raise all of our elk. We don't do a lot of purchasing. **Velvetting Bull** - Weight. The shorter the brow tine the better. That is just what I have learned from being in the business, not personal knowledge. **Producing Cow** - I look for size, kindness and manageability. **Weanling Calf** - I think you are looking at size. It's pretty hard to tell anything about disposition at that age. You would want to look at their background. Fortunately, record keeping is a lot better now than when this industry started.

**JOHN: Herd Sire** - Because I believe in genetics, I think choice of the herd sire is vital. The reputation of the breeder is more important than anything considering the disease problems today. If you want a 1987 answer, it would be different than a 1992 answer. Today breeder reputation would be all important. **Velvetting Bull** - In a velvetting bull, I would look for antler development and size. **Producing Cow** - I am no expert on any of this, but there are some obvious things. You need a certain amount of size and soundness in conformation. **Weanling Calf** - When I first started, I didn't know anything about elk. I bought calves by having confidence that the producer's calves were sound. The calves size relative to their age reflects a lot about their nutritional background. But, they are so young, it is like picking out a puppy in a litter. Viewing calves is a little early to see anything but a major deformity.

**STEVE: Herd Sire** - In elk farming you have got to start out with a plan. If you are going to go into a hunting operation, your only emphasis is going to be antler size. If you are going to go into propagation, the emphasis has to be fertility and disposition. If you are going to go into velvetting, look at disposition as well as the size and conformation of the antler. In the past, only a few spikes would have multiple points and we needed to look at two and three-year-olds. Now with the registry and with the genealogical trails, it becomes easier. We are able to pick herd sires as a yearling now. We don't want a herd sire if he doesn't have six points on his second antler growth and we would prefer seven uniform points. These are beautiful herd sires. We want multiple uniform points with a large base. **Velvetting Bull** - Disposition, because you have to work the animals. One ornery bull is going to hurt other animals when you work with him, disrupt your whole day and get you upset. Get him out of your herd. I'm not concerned with conformation in a velvetting herd. Number one is disposition. Number two is horn size. **Producing Cow** - Number one is her conception rate. She has got to be able to breed back. Number two is her disposition and number three is her conformation. You want middle of the road, uniform size animals. You start breeding large animals and you are going to have calving problems down the road. No giants. And then, you start looking at milk production, motherability and fertility. **Weanling Calf** - Look at that herd of cows. I don't like to look at the calves and only the calves. I want to go back and look at the cows and look at the bulls and them make my decision. Many factors will determine the size of those animals. When were they calved? How they are being fed? Is it natural or creep feeding? So I am not too worried about the size of those calves unless they are extremely small.

*What would be your advice to prospective elk breeders on how to build a herd?*

**ROY:** The fastest way to build a herd is to get stock and breed them. Without stock you've got no growth!

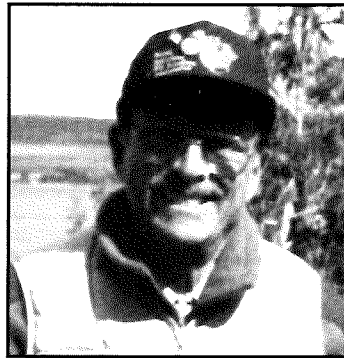
**RAY:** At the time I went into it, I wasn't sticking my neck out a long ways, it was kind of a hobby. We built our first three miles of fence for less than a thousand dollars by utilizing used wire, highline poles and whatever we could get cheap. I feel that's a good



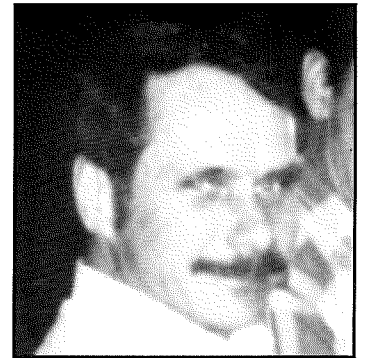
Roy Copithorn, Calgary



Dirk Hardman, Colorado



Ken Nebenzahl, Colorado



Ray Matejcek, Minnesota

way to do any business. Stay away from borrowing money whenever possible and make things pay for themselves.

**BRIAN:** First take a long term look at a geographical look. Do not build out on a flat open prairie. Realize there is a market on most of your products. The nice thing about the elk is having several different ways you can go on them.

**JOHN:** Because the biggest problem I have had is predators, I feel without a doubt that fence is the most important part of this whole business. First, fence. Second, nutrition. I think there should be year around supplemental feeding.

**KEN:** Buy quality animals. I would rather have fewer good animals than a greater number of lesser grade stock. I would buy from reputable dealers. This is really important. We are only a couple years away from experiences in Colorado where people bought from non-reputable dealers. There were some problems. It is cleared up now, but that is an important point.

**STEVE:** Getting into the elk business takes a tremendous commitment of time and capital. Whether you have one calf or one hundred calves is irrelevant. What is important is your commitment to the operation. If you don't have tremendous amount of commitment, don't go into it. Find an operation that is already working and put your elk there on shares.

*There seems to be as many differing philosophies on feeding elk as there are elk owners. What is your basic feed? Do you feed differently for special needs such as antler development, calving cows, young calves?*

**ROY:** Our basic feed is grass and grass/alfalfa hay. We like to feed our elk our best hay and a commercial herbivore ration that was developed by the Calgary Zoo. I like my animals with a little bit of fat cover. We let the cows run themselves down a little bit in the winter time, but not much. We like them on a high level of nutrition.

**DIRK:** Our basic feed is pasture land grass in the summer. We also feed lactating cows a little oats in a pellet to keep them in top shape. In the winter our basic feed is a good alfalfa/grass mix hay with a little bit of supplemental oats to keep them looking good.

**RAY:** I feel that a small amount of grain is very important. Good roughage, high protein alfalfa or clover and young tender grasses are extremely important too. I like to feed very low amounts of corn. Keeping the pressure on getting good quality hay. A good alfalfa hay that is cut young so that is short and fine and not stemmy at all is by far the best feed. But, we end up having a variety of hay with a lot of grasses and clover.

**BRIAN:** Feed is cheap and it goes a long way for what you get out of it. In our situation, we have a lot of acreage and a lot of that is natural feed. For our long term goal, we are fine with that.

**JOHN:** I am really needing to reform my feeding program.

When I got mine from Rush, he was feeding corn and alfalfa. Currently, I feed corn year around and then alfalfa when they need it plus the usual mineral and salt blocks. As far as good, healthy animals, with good size, I think that is adequate. But, if you are focusing on antler development, my reading indicates that some additional mineral supplement is needed. A scientifically mixed ration might not be as inexpensive or convenient, but I am sure it will reflect in the size and antler growth.

**STEVE:** That is one of the most commonly asked questions after somebody buys animals. "Oh no, I got them, now what do I feed them?" Look at other producers in the area. Check the nutrition of your grass and forbs. If you don't have the right nutrition naturally, decide if you are going to have a feed lot operation. If so, you might want expert advise on what elk need, but you have an economic consideration that only a local nutritionist can answer. In Montana, we have a lot of real hard grass and the forbs. We have extremely healthy natural elk herds so all I am worried about is supplementing the winter nutrition. I feed free choice oats and then I have an alfalfa grain mineral and vitamin supplemented pellet. This pellet is a nutritional formula adapted to the feed available in our area. It has corn, barley, sunflower hulls and wheat germ plus a custom mineral and vitamin mix on a base of sun cured alfalfa. It is a 20% protein.

*What are the special mineral or vitamin needs in your area for which you provide supplements?*

**ROY:** In addition to the herbivore ration, developed by the Calgary Zoo, we supplement with copper. We import it from New Zealand.

**DIRK:** Copper.

**RAY:** To my knowledge, we don't have a shortage of any of the trace minerals in our area. So we supplement with the recommended amount of a small vitamin pack that has a lot of your trace minerals and vitamins in it.

**BRIAN:** We supplement some copper and calcium. It is different throughout the state.

**JOHN:** I have been concerned about copper and selenium. But, I haven't noticed any signs of deficiency, so I haven't supplemented except for the standard mineral block.

**STEVE:** Vitamin A. We don't have a copper or a selenium deficiency in our area.

*Other than the native grasses for your region, have you planted any particular grasses for your elk?*

**ROY:** No, I run my elk on native range.

**DIRK:** No, we haven't.

**RAY:** We've used some orchard grass and brome grass. Blue stem and switch grass and some of those native grasses that were always there are available to them. On our good farm land we've tried to plant clover and alfalfa for pasture rather than the grasses.

**BRIAN:** It is all natural. We have a lot of crested wheat

and a lot of blue stem. We also have some undesirable grasses. At times, we have planted some alfalfa.

**JOHN:** No, but I am going to. I am trying to find some perennial winter grass. I am considering clover and maybe some wheat. Unfortunately, I started out with a large base of fescue and elk really don't like fescue. So I am still in the building stages.

**STEVE:** Only alfalfa.

*Have you ever needed to bottle feed calves? If so, what formula or other advise can you offer?*

**ROY:** Yeah, we have raised a bottle calf and it is a real treat. It is hard to describe. They are very different. Their loyalty is incredibly unflinching.

**DIRK:** We haven't needed to bottle raise calves, but we had a set of twins and I pulled one of the calves off to help the mother. We used a lamb replacer. The calf did really well on it.

**RAY:** We have never bottle fed an elk calf, although we have done a lot of white tail deer fawns.

**BRIAN:** We have never bottle fed, strictly because, we do all our calving outside. We are not a pen type situation.

**JOHN:** I have a small book of information on bottle feeding. If you can, get goat milk. Lamb replacement also works. Go with the colostrum at first, if you take them off that early. Colostrum is available at the feed stores. Medicated and non-medicated milk substitutes are a little controversial. I've got a nice bull I raised on medicated, and I don't know that it hurt him. However, the first month, I used goat milk. Elk calves scour very easily. One of my discoveries on scouring is to add a teaspoon a day of either wheat or oat bran. The bran really cures it. Don't over feed. A calf, who was gaining two pounds per day, I lost from over feeding. Don't try to attain the maximum growth rate. If you can gain from one half to one pound a day, that is a good rate.

**STEVE:** Yes, everybody is going to need to bottle feed calves, but only when it is essential. The mother can always do a better job on elk. We use Nubian goats and goat milk has been very satisfactory for us.

*In practical terms, what are your thoughts on the question of whether calves should be weaned or left with the herd? If you wean calves, tell us at what they are then fed.*

**ROY:** We have started weaning our calves at the end of August. The older calves are eight to nine weeks of age and the younger calves are five to six weeks of age. We feel that weaning before the rut gives the cow a better chance to recover and start cycling.

**DIRK:** One year we weaned the calves before the rut and last year we left them in with the herd. We really haven't got enough data back yet to make a decision which way is best for us. After they are weaned we feed them top quality grass/alfalfa mix hay, oats and extra vitamins

Continued on page 23

6-20

# Elk Chatter




Elk Horn Arch made by Scott Ault, Circle A Farms, Good Hope, Illinois.



Some of the 100 bulls that were velveted at Johnson Elk Farm, Bucklin, Missouri in early August.



Craig McConnell, Elk Echo Ranch, Stoneham, Colorado checks out one of Rush Johnson's Bulls, velveted earlier — note Rush's walk-in freeze in the background.

  
**DEPARTMENT OF AGRICULTURE**  
**STATE OF MISSOURI**  
 JEFFERSON CITY

CHARLES E. KRUSE  
DIRECTOR

JOHN ASHCROFT  
GOVERNOR

March 23, 1992


Mr. Rush Johnson  
Route 1  
Bucklin, MO 64631

Dear Rush:


It has come to my attention that you will soon be meeting with members of the Missouri Congressional Delegation to discuss Missouri's elk industry. I compliment you on your leadership in establishing this industry in Missouri and look forward to working with you and other elk breeders on issues of mutual interest.

Missouri is blessed with a rich diversity of agricultural enterprises. There has been growing interest in alternative agricultural enterprises and several commercial elk operations are now in operation throughout the state. We are excited about the potential of this growing industry and the contribution it is making to our economy.

Again, thank you for your leadership in the industry and I look forward to working with you closely in the months ahead.

Sincerely,  
  
 Tim Kelley  
 Director of Agriculture

TK:vsd

  
 Post Office Box 630, Jefferson City, MO 65102-0630  
 1016 Missouri Boulevard

Telephone (314) 751-3359



King Andrew says "No one can see me now!" King Andrew resides at Johnson Elk Farm, Bucklin, Missouri.



Sons of Diamond  
One Year Olds - June 1991

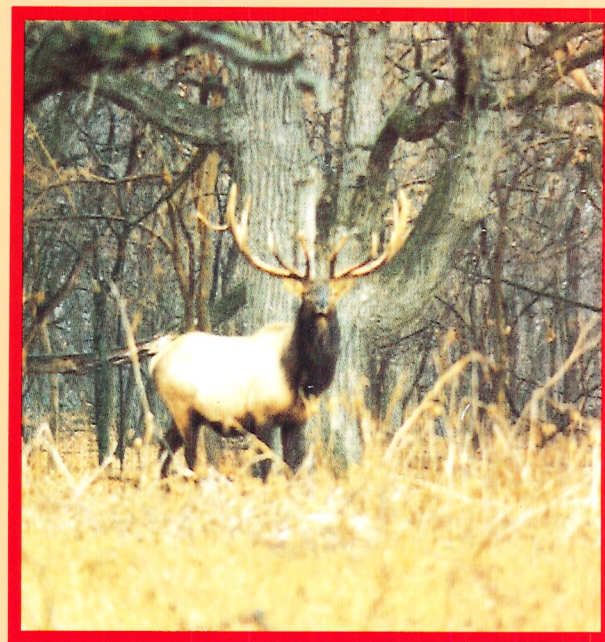
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# Louisiana Legalizes Elk Industry

Prior to the adoption of Act #41 it was illegal to raise, sell, breed or transport elk within the state of Louisiana. Elk had been outlawed by the State several years before when a captive bull in a Louisiana zoo became aggressive and injured zoo workers. As a result of this incident, Louisiana placed elk on the list of animals banned in the State under the "dangerous, wild animal" clause. Prior to passage of Act #41 white tail deer and antelope were allowed in the State under the jurisdiction of the Wildlife Department.

A group of Louisiana NAEBA members organized local elk ranchers and other parties interested in pursuing the elk industry in Louisiana and adopted the goal of lobbying the State Legislature to allow elk to be recognized as a legitimate agricultural animal for farming and ranching within the State and to place those activities under the jurisdiction and control of the Louisiana State Agriculture Department rather than the Wildlife Division.

This group met with representatives of the House Agricultural Committee and persuaded Representative Dwayne Cooley to sponsor their bill. Mr. Cooley is a businessman from DeRidder who owns and operates two feed stores and has become very interested in the elk industry. The House Agriculture Sub-Committee began research on the bill and NAEBA was very supportive of the group's efforts, supplying written and visual materials highlighting our national activities and portraying the positive aspects of elk raising

and the vast economic potential that elk offer as an alternative agricultural animal.



*Jimmy Kelley and Representative Dwayne Cooley with one of Jimmy's bottle fed elk calves.*

Hearings were scheduled before the Louisiana House of Representatives for discussion and possible ratification of Act #41 which would legalize domestic elk within the State. Louisiana NAEBA members (Jimmy Kelley, Roland Pesson, Jeanette DuPree, Oscar Killian, Wesley Jackson and Fred Atkinson) asked Sam Withiam to come to Baton Rouge and participate in the hearings. Sam travelled to Louisiana and met with the Commissioner of Agriculture and other State officials and appeared before the General Assembly to address the Legislature in behalf of the elk producers. The group received a warm reception from leaders of the Louisiana Agriculture Committee including a very positive endorsement from Bob Odom, Commissioner of Agriculture for the State of Louisiana.

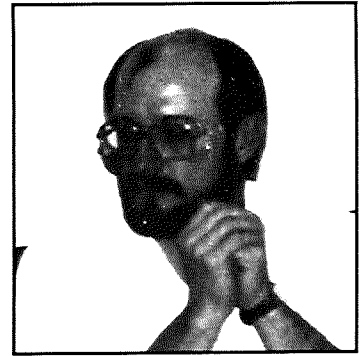
Shortly after these hearings, NAEBA people involved in the effort and other industry supporters were elated to learn that Act #41 had been passed by both Houses of the Louisiana Legislature and signed into law by the Governor of Louisiana. Elk producers in Louisiana are now free to own, breed, propagate and sell elk, and to operate under the guidelines and jurisdiction of the Department of Agriculture. Passage of Act #41 in Louisiana is truly a victory for NAEBA and the elk industry as a whole and sets a precedence which serves as a positive example for other States to follow.



Brian MacCarty, Wyoming



John Murney, Oklahoma



Steve Musick, Montana

Continued from page 18

and minerals until they are 15 or 16 months old and they are starting into the rut.

**RAY:** We have never weaned our calves. I raise my elk as close to a natural herd as possible and try not to interfere with nature in any way.

**BRIAN:** I definitely think you should wean calves, because it increases your production. Your best bet would be to do it before they start breeding again, just for the cow's sake.

**JOHN:** I have probably weaned the bottle babies later than I should have at about 4 to 5 months. But I have never weaned the calves from my cows.

**STEVE:** I have always felt calves should be weaned and in late September or early October. However, I'm starting to change my opinion and now think maybe those calves should be pulled off in the middle of August. At that point the cows still have maybe four weeks to build themselves up before they go into breeding. Because of the logistics of my operation, I wean after they get done breeding or towards the end of the breeding, but I am not sure that is the best.

*What are your thoughts on breeding 15 to 18 month heifers? If you use certain age standards, what are they?*

**ROY:** We are trying it with the elk. I am not really happy with the yearlings that we have bred so far. They seem to conceive later and they are calving in July. We will see if we can back them up into a June calving frame or not. That will be the criterion we use evaluating the breeding program. The economics are such that any calf you can get your cows to produce is a plus. The only free ride you get in my cattle herd is as a virgin heifer. Every other cow in my herd has to produce cash flow and she produces that either with a calf or with herself.

**DIRK:** I think it is beneficial to breed them at 15 to 16 months old. If your nutrition levels were what they should have been, you should have no problems.

**KEN:** We pretty much look for the cow to be well over 400 pounds before we breed them at that age.

**RAY:** In the years we've raised elk, all of our heifers have always been bred. We have never had an animal that should have gotten bred not bred. We've had 100%, although we have lost calves to a birthing problem or something like that.

**JOHN:** I pasture breed mine so I don't have that much control over the heifers I have out there. If they get bred, they get bred. I am assuming nature will help me out there a little bit. The guideline I have heard kicked around is about 450 to 500 pounds and maybe there is not such a high yield at that.

**STEVE:** I don't have an opinion there. Currently, I don't breed my heifers. I'm not sure you can't breed heifers and at the price of elk I am inclined to believe that you can afford to breed them. If they are physiologically mature enough to conceive and you have the commitment to

feeding them nutritionally, I don't think you're going to have any problems, especially where you can find sires which are throwing small calves. I feel that it is a legitimate practice and can be successfully done. The reason I am saying that is simply economics.

*What do you feel is the optimum number of cows per bull?*

**ROY:** The jury is still out on that one. 15 to 25 head is what I am told in a single bull pasture. I look at my cattle operation again where the bull salesman wants me to have one bull for every 20 cows. I tell them that for me the ideal is one bull to 50 cows. I use fewer bulls than my neighbors, my conception rates are as good and I don't have as much bull damage.

**DIRK:** I would say right around 30.

**RAY:** I can't answer that other than to say that in Canada they are using 80 and 90 cows with a bull and having quite good success. I have never had that large a number, but after seeing their success, I won't say it can't be done.

**BRIAN:** I think 25 to 30 is the optimum number. If you are specializing in one bull and you are getting a lot done with him, you might want to go with a few more. But, I would say from 25 to 30.

**JOHN:** I am up to about 20 per bull. That seems to be okay.

**STEVE:** I would never put more than 15 bulls to a spike. Absolutely never. You will find bulls that act much differently. A mature bull that is calm and says in good shape and keeps his mouth shut can service up to 40 head of cows with no trouble. But one of these nervous types that runs the fence and bugles and wears himself down probably isn't going to do you any better job than a spike. If that old bull starts to go down in body condition, he just isn't going to breed as good as the other in good shape. And any time you run multiple bulls with any herd of cows, the number those bulls are going to be able to cover decreases dramatically because they are going to be fighting each other.

*Do you leave bulls in with the cows year round or do you pull the bull or replace him at certain dates? If so, what general guidelines do you use?*

**ROY:** We leave our bulls with our cows during the breeding season. I like a 50 day breeding season. We change them after 30 days.

**DIRK:** So far we have been using the same bull throughout the entire rut. So we haven't pulled a bull. But he is just in with the cows during rut.

**RAY:** We let them all run together as a natural herd. The herd bull fights off the rest of the bulls and everything is done as it would be in nature.

**BRIAN:** We have to leave him in year round, we have a natural setting on our ranch.

**JOHN:** I would like to move them out, but at this point I

leave them year around. I was concerned with late calving and considered taking my bulls out at Thanksgiving. This year I had a beautiful calf in late October that is doing very well. If the nutrition is there and if the mothers have a little bit of fat on them, the birth date doesn't make any difference.

**STEVE:** I do both. I have bulls out in my hunting herd that are rutting with them year around. I believe the best way is to run one bull through one cycle, then pull him out and change bulls.

*What, if any, special arrangements do you make for calving?*

**ROY:** Our rules in Alberta require that we tag and identify calves at birth. We have our cows in a small birthing area. We monitor the fields, watching the cows for signs of labor. When they calve, we go in, find the calf and tag him.

**DIRK:** We try to spend a lot of time with the elk during calving season making sure no cow is having a problem. We like to have them in a little closer to the house so we can just glance out the window every so often to keep an eye on them.

**RAY:** None at all.

**BRIAN:** We make no special arrangements. It is all natural.

**JOHN:** The only thing I do about calving, is watch. When they are going to calve within 48 hours, their behavior is a little different. Once they disappear, or start laying even a short distance away from the group, I expect my calves within 24 hours. All I do is go find the calf and make sure that it is not dehydrated and is able to stand up and nurse.

**STEVE:** None

*What procedures do you follow with newborn calves? (Tagging, weighing, record keeping, etc.)*

**ROY:** We tag them. We weigh them. And we give them back to their mothers.

**DIRK:** We try to tag every newborn calf and record his mother. At that time we look back to see who his sire would have been and keep those records. We are thinking right now about weighing a calf at birth, but we haven't so far. We use binoculars a lot. When the cow first has a calf, she needs time to lick it off and really imprint on her mind which calf is hers. If you bother her before this process is complete, she could go off and abandon the calf.

**KEN:** We do not go in there the first 24 hours and take a chance of the mother abandoning him.

**RAY:** We have just started tagging our calves when they are newborn, whenever we can find them. Some of them never can be found until later in the year.

**BRIAN:** No tagging. We leave them alone because they are in a natural setting.



**JOHN:** I will pick them up and make sure they didn't have any fractures during delivery and coax them to stand up. But, I have minimized the amount of handling, because I don't want to risk rejection by the mother. I have been hesitant since an experience with a really sick calf, just a few days old, which I was able to save after a day of intensive handling, IVs and shots. The cow didn't take the calf back. As an IV for calves, I use D5 Ringers (lactated ringers solutions with 5% dextrose). Usually a liter will take care of a calf, but I have had to give as much as two liters.

**STEVE:** I run a range type situation. The laws of Montana are making us tag our animals and identify them young. That is why I'm totally changing the way that I am running my mother cows. You tag the calves as soon as they drop so you can identify that calf with that cow. That makes good sense as far as keeping good records on your herd for registration and genealogical studies.

*In general, what vaccinations and medical schedule do you maintain?*

**ROY:** We vaccinate our calves with 7-Way and Ivomec and we switch every other year to Safe-Guard drench or white drench.

**DIRK:** We try to vaccinate once a year with an 8-Way that would cover most cattle diseases. We also worm every year with Ivomec.

**RAY:** We do almost none. We do check manure for parasites, but we have never really had a problem. Anytime an older animal is caught, we will give it Ivomec if we feel it looks a little rougher than it should.

**BRIAN:** We work our animals once a year. We give them an 8-Way vaccination and we worm them. We don't bangs vaccinate.

**JOHN:** I worm with Ivomec 4 times a year. I know it is working because if the animal receives it, Ivomec makes ticks fall off. Rather than give them shots, I double the dose and soak their daily ration of corn in it overnight before feeding it to them. It works and it is not traumatic.

**STEVE:** As soon as I wean the calves, I vaccinate for 8-Way and I worm them with Ivomec. When I turn them out in April or May, right before the vector season, I re-inoculate them with 8-Way and I Ivomec them again.

*What precautions, if any, do you take in introducing new animals into your herd?*

**ROY:** Tuberculosis was not an issue when we were introducing animals into our herd. We're under quarantine right now. Any animals that we bring to the ranch in the future will be to be both skin and blood tested for tuberculosis. When the quarantine is lifted we will probably split our operation into two different areas. One area will probably be a quarantine area.

**DIRK:** In Colorado we have to have a red deer test to make sure the animal is pure elk. We also make sure they have brucellosis and TB tests. We keep them separate from the herd for 45 to 60 days. When we move an animal into an already established group we make sure she has plenty of room. It is important if you are feeding hay, to take a little extra time and make her a pile a little away from the rest. If you don't, the others will run her off until they establish their pecking order.

**RAY:** We hadn't bought any animals in 12 years. Then this last year we did some trading and bought a couple. We're very careful to have them 4-Way tested and make sure they come from reliable herds.

**JOHN:** The heifer I recently bought at the NAEBBA sale will be the first new animal I have introduced. I have had a few white tail jump the fence and I am deeply concerned about that.

**STEVE:** Since the TB scare, a hell of a lot different! Before that I was pretty stupid because I bought animals all over Canada and the United States and just introduced them into my main herd. I was extremely lucky. Now, be careful where you buy them. Be sure they are whole herd

tested. Keep them in quarantine until you are able to retest. That's of utmost importance now.

*When it is necessary to tranquilize an animal, what procedure (equipment and drugs) do you recommend?*

**ROY:** We have a handling facility that our animals have to go through to get to water. So when I want to catch one, I shut the far gate and catch them. We put them in the tub and inject them with Rompun.

**DIRK:** We recommend using a handling facility. But one of the tranquilizers, Rompun is probably the safest to use. We do not tranquilize unless we absolutely have to. If you have an animal hurt or something and you can't get her into your working facility, then I recommend a dart gun.

**RAY:** I'm a firm believer in Rompun. We've used Rompun when we've cut antlers, we've never had a problem with it. I believe in starting with a large dose rather than beginning with a small dose and working up. I've found that doesn't work. We hit them hard and have had no problems at all.

**BRIAN:** I would recommend Rompun with Yohimbine, just because I have had better luck with that than Sucostrin.

**JOHN:** I would recommend M-99, but is almost nonexistent. So I have had to use Rompun. Rush uses succinylcholine (Sucostrin). Old hand who have had experience with that are very successful. But for a user friendlier drug, Rompun is a lot safer.

**STEVE:** The only time you want to tranquilize an animal is under emergency situations. Right now the two drugs of choice that are easily available are Sucostrin and Rompun. Sucostrin is very quick acting, but very deadly. Rompun takes the longest and is by far the safest. You need to be very, very careful in emergency situations because if your animal is hot it will take a substantially higher dosage and they will die so much easier. The safest and the best drug I have ever used is M-99 with fifty-fifty for the reversal. That is the most beautiful drug you can use, but it is very expensive and it can only be acquired from a veterinarian who has a narcotic license. I have both drugs. If I have 15 minutes for the animal to go down, I'll use Rompun as a drug of first choice. If I've got to knock him down immediately, I'll use Sucostrin. If you use Sucostrin in an emergency situation, on a hot animal, be prepared to administer CPR for a long time.

*What medical equipment and What medical equipment and medication do you keep on hand?*

**ROY:** Medical equipment that I would keep on hand for my elk specifically includes lamb OB chains, Rompun, Ivomec, 7-Way, Penicillin and Yohimbine. It's really pretty simple.

**DIRK:** We keep penicillin, LA 200 and we have our dart gun as a precaution.

**KEN:** The back fence neighbor is our vet!

**RAY:** Rompun would be one of our only drugs. We are only using that for cutting velvet. Other than that, we try to use a facility where we don't need any drugs.

**BRIAN:** Antibiotic, some sort of bandages, but mostly oxygen for a breathing type problem.

**JOHN:** In my dart box, I keep antibiotics and worming medicine. Every time I knock them down, I worm them and give them a long acting penicillin. Benzathine penicillin is available at the feed store. You give it subcutaneously and it lasts about 10 days. I have had pretty good luck with that.

**STEVE:** LA-200, Tylan, Vitamin A, electrolytes, sulfa powder, suture needles, Rompun, Sucostrin, Valium, long-lasting penicillin, Blu-Kote, Ivermectin and Levasole.

*Do you have any practical suggestions for protecting elk from flies?*

**ROY:** Our fly season runs from about the 15th of May until about the 10th of September. Our best fly control is

20 degrees Fahrenheit. But a dugout is a nice touch because they love to play in water.

**DIRK:** Flies are usually not too bad. We are in a pretty fly free area.

**RAY:** We've just let nature take care of that on it's own.

**BRIAN:** We don't have a lot of problem with flies. We are just in the right climate.

**JOHN:** This a tough problem. The best thing would be to have them where they have plenty of space. They should not be confined in a small area where the ground is wet and manured. In each lot, I have a deep large several acre pond. When flies are bad the elk go in there.

**STEVE:** A good mud hole! I'm serious. I can't say I am a naturalist, but the best prevention for flies is good thermal protection and a mud hole. They just love to roll in the mud.

*What steps, if any, can be taken to assure maximum antler development?*

**ROY:** Good levels of nutrition. Fat elk produce more velvet. I do not believe that you can over feed a bull elk producing velvet. If the bull has the genetic potential and he does not have the body condition, you won't get maximum production. It is a two way street. You will never know how good your genetics are if your animals are in a depleted condition.

**DIRK:** Nutrition and genetics. You need both. You need a bull with the genetics to produce good velvet and you need the nutrition to allow him to reach his full potential.

**RAY:** Again, good pasture and good hay has always been what I've strived for, although I've seen tremendous results in a few cases with pasture that I didn't consider good.

**BRIAN:** I think feed is the most important thing, and genetics of course.

**JOHN:** I feed them until they turn around and walk off leaving feed in the feeder. I can't think of anything but just nutrition.

**STEVE:** Good nutrition and a good internal and external parasite program. Never let the young animal lack for nutrition.

*At what point can you predict if a young bull will be a prime velvet producer? What standards can be used to make that judgement?*

**ROY:** If the breeder kept records on him as a yearling and if he is in the top third of his yearling class, I believe he will remain in that top third. Yes, some bulls without large body size have got 25 pounds of velvet. But generally, it seems as if the big bodied animals produce the big antlers.

**DIRK:** At 1 year-old you have an idea by whether the antler is branch antlered or has just a single spike on each side. By the amount he cuts the third year, you should have a real clear idea if he is going to be a top producer.

**RAY:** When a spike has a lot of points, an extremely heavy base and a wide spread, it normally indicates that we are going to have a good animal. And yet, we have had some extremely good animals develop from spikes that were just normal spikes without any branching.

**BRIAN:** Well, I think, as a yearling he will show as much potential then as he ever will. If you have seen enough elk, you are going to be able to tell right away.

**JOHN:** My 8 by 8 had a forked spike and that is a very good sign. The Rocky Mountain Elk have a very distinct antler pattern. You can look at hundred year old pictures of elk and it is this identical pattern. I am kind of fond of that. But, when you get Manitoban or anything mixed in, all bets are off for predicting anything about antlers because they have got spikes that are four or five points. I am not interested in poundage as much as that typical

configuration. To me, even a symmetrical 6 by 6 is just perfect. I am not much into those ragged looking antlers. They are massive, but I don't find them as pretty as a perfect rack.

**STEVE:** Current, still inconclusive, research suggests that a spike's pedicle measurement will indicate the potential velvet production of that particular animal. As we study the genealogical trails on these animals we will be able to tell if a characteristic horn trait is passed on as we currently suppose. Proof will take many generations of records. Multigenerational genealogical trails are also going to be a major factor in future herd sire production.

*What do you cut to get a Grade A velvet and to what degree do you take age into consideration?*

**ROY:** To get Grade A velvet we monitor the bull's development. It depends on the bull. If you're conscious of the drop off dates, you really want to start watching them at 55 to 65 days. They are usually cut by the time they are 65 days from drop off.

**DIRK:** We try to cut at about 65 days after they have started growing their horn.

**RAY:** We cut the velvet just when it's getting ready to split at the 4th and 5th point. We cut 26.8 pounds of Grade A velvet off my four-year-old. I feel six-years-old is still the prime maturing point when a bull starts showing his real potential. Although I think he can still get better after that.

**BRIAN:** We are not cutting velvet so I don't know a lot about that, but from what I am told, May and June.

**STEVE:** You can't get Grade A velvet from a young bull. Starting with three-year-old bulls you will get Grade A. You simply have to look at each individual bull for signs of calcification at the base. That bull is going to be different every year depending on the nutrition and the climate. You can't go by date, you've got to go by each individual animal each year.

*What suggestions do you have for marketing velvet from a small elk operation?*

**ROY:** We have marketed our velvet to Pacific Agritrade ever since we started. It is convenient for us because their agent is 125 miles away. They have treated us fairly. Just get out there and talk to some producers and find out where they are marketing.

**DIRK:** We have a velvet antler pool in Colorado where more than just a couple buyers can bid on the velvet.

**RAY:** We've stuck with other ranches to pool a large amount of velvet.

**BRIAN:** I would sell velvet, if you are just getting into the business. Take care who you deal it to.

**JOHN:** I am just beginning to consider velveting. First of all, I have kept every antler that has ever dropped. I started out with calves and now they are so big that they almost destroy their racks fighting. I have an 8 by 8 that is down to a 4 by 4. So aesthetically, it is a little different than it was before. Also there is the possibility of injury. I have a really strong internal struggle about this because to me, one of the most important things about raising elk is the pleasure of viewing them. But, I haven't make up my mind yet.

**STEVE:** It is always worth it, but don't do it yourself. There are enough custom velveters around who really know what they are doing. Instead of selling it for 80, you are going to get 65. But in no situation, other than on a hunting preserve, is there room for hard antlers on a game farm.

*Handling facilities are a major expense for new elk breeders. What do you think a minimum arrangement might be and what type of facilities are you currently using?*

**ROY:** A minimum facility would consist of a catch area feeding into a smaller area with a door on it to hold them or funnel them into your facility. We use a circular tub with holding pens off the back side of it. The biggest trick to capturing them is to make the elk want to do it. We achieve that by putting our access to the watering areas through the handling facility.

**DIRK:** We use a rotary system of two gates which will go in a complete circle and will squeeze an animal up. You can go from one extreme to another. It depends what kind of money you want to spend. You can buy squeezes for \$4,000 or you can build your own for \$800 to a thousand which will work almost as well. It might take a little longer and require a little bit more patience on your part, but it will work.

**RAY:** I've kept my facility very simple. We've found that a simple squeeze gate where you can squeeze an animal up by hand is excellent for elk. Some of the hydraulic squeezes can definitely be better, but we have had no problems just using a gate.

**BRIAN:** I don't think anyone should start buying elk without the facilities first. That is like putting the cart before the horse. Minimal facilities would be at least one pasture with a smaller corral set up inside for working the animals.

**JOHN:** I have a minimum arrangement. I have been minimally arranged for five years and I don't like it. Unfortunately my times is shared by other things. Rather than driving my animals, I tend to lead them, say with a hat full of corn. I have got a stock trailer, when I want to move a bull to another pasture, I put corn in the trailer. When the bull walks in to get it, I close the door and move him. When he steps out, he's not stressed, he starts eating immediately. That is how I move my animals around. I do have a little chute arrangement, but I don't have a squeeze chute.

**STEVE:** Well I have extensive facilities on my place, but I had unlimited capital to start with. Your minimum facilities have got to be a catch pen with a chute. We are looking at enough government regulations that you are going to have to have working facilities. Your facilities should come before your animals. The only way you can do that is by putting them out on shares at an established game ranch until you have your herd built up and you have enough money to build your facilities. The only other way is to just build a pen and let them run loose. I am not sure that we are going to be able to do that and still comply with government regulations, especially in the Rocky Mountains.

*What special problems have you had with fencing and how have you solved them? From your experience, what type of fencing and gates work best for your area?*

**ROY:** I'm really lucky. When I went to buy fencing, our wire supplier made me an offer I couldn't refuse. He supplied me with a fencing material that was, as far as elk go, absolutely top of the line. It is eight feed of 9 gauge watchman fabric. It is a 6 inch page wire. It is very difficult to work with because of its extreme weight, but when a full grown bull elk runs into it, he is just tossed back into the pen. You need a quality fence. Your operation hinges on your ability to maintain your animals in confinement. If your animals are out you are really at risk.

**DIRK:** We've had problems with deer on the outside running into our fences. I'd recommend high tensile, there is a lot of difference. We have a little of both kinds and we have had deer hit both. The high tensile will withstand a lot more pressure. We use wood posts.

**KEN:** In some parts of the country you have to have capability of grounding for lightning.

**RAY:** The only problems we've had is in the years when we have extreme amounts of snow. A heavy snow load can pull down fences which then require some repair in the Spring. But fence has not been a problem. Elk do not bother the fence. They do not want to get out. We have 160

acres, with several cross fences in there because some of this land is still farmed.

**BRIAN:** Our biggest problem is erosion because we have 40 miles of fence. Any time it rains, I don't sleep well at night. For a pasture type situation, your high tensile New Zealand fence is probably the best. For a handling facility, the more solid you can make it the better off you are.

**JOHN:** I put hog wire over regular cattle gates and double them two high. That's not what I like, but it is quick.

**STEVE:** Number one, you have got to have woven wire fence. Electric fence is not a peace of mind perimeter fence. It is just not acceptable. The second thing, is strong gates that are easy to open and secure. I don't think you can beat the Tightlock fencing for elk. You should have them at least five and a half to six feet tall. Eight foot high fences are required in our area to comply with Montana laws.

*What size pasture do you recommend for your region and how many animals would you use in this area?*

**ROY:** Our region is a fescue prairie. We currently use small 30 to 40 acre pastures. To me a big pasture is 4 sections, but you talk to people in Albuquerque and anything less than 10,000 acres is a back yard. How you get your animals to graze your pastures is directly related to pasture size. The better use your animals make of your pasture, the better your pasture is.

**DIRK:** It all depends on how many elk you have for what size of pasture. I think the elk will do better in a little larger pasture. They have a little more area to get exercise in. I would really recommend 20 acres no matter how many elk. Even if there are only one or two elk in there they still need room to move about. In 20 acres, if they have their room, we can probably run at least one elk to the acre in Colorado.

**KEN:** And then they have a number of these pastures and they rotate them.

**RAY:** I think the amount of pasture per animal depends totally on the type of pasture. The pasture I have could support a lot more animals, but we have been taking crops off of it and allowing the animals to graze after the crops and sometimes with the crops.

**BRIAN:** Well we have one 23,000 acre pasture. I don't know that I would recommend that for a horn cutting, but for hunting it is real nice.

**JOHN:** I've been putting about an animal per acre and a half. On one side I have four acres per animal, but it is under grazed. I think the maximum would be an acre and a half per animal in good pasture.

**STEVE:** That has to be an economic decision. In my region, I wouldn't go with less than 10 acre paddocks. The size isn't as important as the thermal cover and the nutrition within the paddock.

*Do you have a schedule of rotating your animals from pasture to pasture? If so, what determines the schedule?*

**ROY:** Eventually we will end up there. We are still in the growth stage. Our cross fencing isn't complete, but yes, we will.

**DIRK:** The main thing that determines the rotation schedule is the availability of the grass. If they pretty much have it eaten down, we move them to another pasture.

**RAY:** No, we don't. We try to let them have as much room as possible whenever we can. Whenever we have crops like corn, we keep them off until it is harvested.

**BRIAN:** No schedule, no rotation.

**JOHN:** I've got a large pasture that I'm dividing into four pastures. That will allow me to get in there to work the ground and seed grass. At this moment, they are almost

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free ranging the area is so large.

STEVE: No, I don't.

*What records do you keep on each animal?*

ROY: We keep records of birth dates, weaning weights, antler production, the bulls we turn out with the cows and any drugs we administer.

DIRK: Right now we are trying to keep records of the sire, the dam, the velvet weight on bulls and calving records.

KEN: We keep the microchip number, the NAEBA herd registry and USDA. The Lone Cone tags are keyed to age and lineage information. Tag colors record other info.

RAY: Actually, very little. We have just recently started keeping track of which cow mothered each calf. Our records have been mostly determined by keeping the best bull back for breeding and crossing genetics of very good breeding lines.

BRIAN: The only records we have are trophy records.

JOHN: Just records of the offspring and the bull.

STEVE: For each animal I keep a calving record, velvet record, a general disposition record and a horn record.

*What were the most difficult challenges to overcome when you first started raising elk?*

ROY: The most difficult challenge when we started raising elk was to borrow the money. We haven't lost any money at it yet. The elk we are raising right now are meeting the mortgage payments. When my wife and I went to borrow the money, our cash flow projection showed we would not make money for the first three years. The banker found it interesting that we would be honest about that. Also, he was amazed at the possibility of an agricultural enterprise that might pay for itself with six year money.

DIRK: Trying to talk to people to find out how they were handling their elk. When we got into the business, very few ranchers had handling facilities. A lot of herds were just left to run. The difficulty was in trying to find people who knew a little bit more about the animal, so I could learn.

RAY: At the start, handling them when we didn't really have any idea how to do it. Just to come up with a system and a few gates to enclose them, without them getting excited, was hard until we learned how to do it.

BRIAN: Politics and state government. Game and Fish.

JOHN: One of the most difficult things was learning how much you can do with one of them safely. You wonder, "Can I walk in there with them?" or "Should I feed through the fence?" My two biggest worries were poachers and maintaining a fence.

STEVE: Keeping my neighbors out. Poaching.

*What advice would you have for newcomers to the elk business?*

ROY: Talk to people. Elk breeders are very open and will talk freely to you because the industry is new enough. Lou Wyman is probably the granddaddy, he has been in the business longer than anybody I have met. Rick Alsager's been in it almost as long as Lou. It took them years to find the answer to the questions you ask, so they understand your struggle. It is not like a conventional business where your knowledge is everything. In this business the livestock is everything. If the livestock is dead, you have got nothing. And you care, you care.

DIRK: Newcomers to the elk business need to talk to as many people who are raising elk as they can find. Ask all kinds of questions. I'm still learning.

KEN: I think the NAEBA is important. We are new in the business, but we were at the convention at Kansas City last year, we're here this year, and are learning a great deal. We are able to meet a lot of people and exchange

ideas one on one in addition to the seminars and the formal programs. I think newcomers need to learn how to prepare a facility and how to have a place to raise their elk. Once they are past that, buy quality. Buy Lone Cone Elk, in other words!

RAY: Try to spend as little money on your facilities as possible. Put the money into good breeding stock.

BRIAN: My advice would be to buy quality animals and start out right.

JOHN: Don't under feed the animals. They won't over eat. I had advice that over feeding causes difficulty calving. So, I didn't feed as much as I should have and as a result I didn't have calves. If they don't have enough fat on them, they won't have a calf. I would say nutrition is more important than anything else. About all you have to do is just watch your cows when they are calving, worm frequently, do not over crowd them and feed them all they can eat.

STEVE: Take the time to visit as many good elk operations as you possibly can. Five is not enough, I mean twenty. Look at facilities. Take the time to talk to other producers. Talk to them about economics and the problems in your particular area. If there is no one in your area, get a hold of the NAEBA and get a list of the very knowledgeable producers.

*What has been your most astonishing experience in raising elk?*

ROY: Our bottle baby is pretty astonishing. I'm amazed at her devotion and the bonding process she went through. She knows she's an elk, but she doesn't like it.

RAY: Last summer for some totally unknown reason, two bulls got so badly scared at night that they smashed down a gate and took off running. It was dry, so we had given up looking for them the first day, thinking they were close and would probably come right back. The second day we got a little more worried and flew around in an airplane looking for them without success. Then we went back to trying to track them even though the ground was dry. After picking up the trail, we realized they were heading straight North and that they had never varied in their direction at all. We could go for miles and if we had it straight sooner or later we would pick up the track again because the animals kept heading straight. We finally found them calm as could be, just standing there 12 miles from home. They had never stopped running straight North for 12 miles. We tranquilized one and brought him home. When we went back for the other one he had turned around and headed South. The next day we tracked him all the way back home.

BRIAN: Just to see the growth in the last two years in the United States.

JOHN: I was raising a bottle baby, so I needed to take her with me on the 100 mile drive between my home in Tulsa and the farm in Muldrow. When she was real little, she made the weekly round trip in the back of my jeep. She got used to it and when it was time to load she would just climb in. This particular time, we had been in Tulsa for about a month waiting for an opportunity to get away. I backed the jeep up to the gate, but when I looked at the calf, I realized she had experienced extensive growth and now weighed around 400 pounds. I thought, she is now so big, we will probably have to use the horse trailer. But, I went over and measured here and then I went back to the jeep to measure the inside height to see if maybe she would still fit. Measurements indicated it would be very close. And as I was still measuring the interior, the elk jumped into the jeep with me! So we didn't have any trouble loading!

DIRK and KEN: I think probably Dirk's happiest experience was being the surrogate father for the twins births. Dirk left the male with the mother and bottle fed the female. I don't think it is a real smart idea to bottle feed males, they can get kind of obnoxious when they get older, which is a kind of sexist remark.

STEVE: How close I've come to getting killed by cows

when I am catching calves and tagging them. I couldn't believe it the first year when elk I had been able to pet came so close to killing me when they went into rut. If you live through it, you will never forget the experience. They will change overnight.

*What has been your biggest rewards as an elk breeder?*

ROY: The wonderful people I have met. It is a great business to be in.

DIRK: Just being able to raise elk and watching the elk play and do well is my biggest reward.

KEN: I would say the same thing. It is an aesthetic experience. Coming out and seeing the elk is a great treat. And that is why we are in it.

RAY: To have produced some really good animals. Animals far better than we though we were going to be able to raise.

BRIAN: Well, that is a tough one. I just enjoy working with the animals, they are smart and they adapt well to our country. Of course again, I am in a different type of situation, but elk really utilize the feed and the country real well.

JOHN: Just seeing them every day. I would feel the same thing if these elk were worth only \$500 a piece. In fact, when I got these elk, they were worth \$500 a piece. That is not why I have elk.

STEVE: Those baby calves when they drop.

*What do you predict for the elk business in the next five years? In the next ten years?*

ROY: Alberta was in a growth stage when a dramatic kill of our local population occurred because of tuberculosis. Herd health in Alberta, I believe, now is cleaned up. Alberta is in for growth. In the United States the purge on the health issue hasn't come. I fear it will come. It will be controversial and it will be painful for those people involved. I see our situation in Alberta now as being at the edge of the woods. There will be a little more blood letting and then we will go into a growth phase. Our domestic herd has been knocked back 50%. It will take us four years to get back where we were last year. So we have ten years of growth to be where we need to be with our domestic herd numbers.

DIRK: I think elk will do really well the next five years. In the next ten years, they may level off in price. I think they will be good for a long time.

KEN: That is exactly the way I feel. For five years, unless other economic conditions depress the market, elk prices are still going to be going up. Five years will be required to generate the over 200,000 animals behind fences needed for a venison industry. If the first five years has brought us to that point, the second five years will cause the leveling off to which Dirk referred. The demand for breeding stock will have been substantially satisfied. Everyone thinks that they will be able to market elk for double the price of beef. But the disparity between the current prices and the carcass value is far too great to hold up. I think we all feel that elk will maintain price, but the astonishing rate of appreciation will cease.

RAY: I feel it's going to do nothing but get better. The prices will hold steady or increase. The future looks good because the elk is an extremely good animal to raise. It is calm and very rewarding.

BRIAN: In the next five years I would say that the elk business will do real well, even throughout the next ten years.

JOHN: I don't have a crystal ball. I hope prices stay up, but I have no idea.

STEVE: I predict the elk business is going to concentrate in the Midwest. I predict that meat is going to be the foundation of the economics. I predict that it is going to be a major contribution to the animal agriculture of the United States.

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contributions in the past will tell you that there is no better way to learn more about our industry and our animals. Don't forget that you can save money by preregistering. Plan to spend a few extra days after the Convention and make it a family vacation.

This association, as all associations do, has had its share of growing pains. I am pleased to say, as this administration comes to a close, that I can deliver to the new President an association that has not only addressed its problems, but has resolved a vast majority. Most importantly, this Association has matured into an organization that is not just the extension of the personalities of one person or group of persons, but an organization that has developed its own personality, keeping the interests of the industry at heart and with the acceptance and respect of the scientific community, the State and Federal regulatory bodies and the agricultural community in general. We must continue to benefit from the lessons that we have learned, select representatives who are willing to give of themselves to continue the building process, and be willing to give of ourselves as our talents and abilities allow. The more you give the more you will receive. May God Bless You All!

Sam Withiam  
President  
North American Elk Breeders Assn.



Larry Schroeder, North American Elk Breeders Association member, from Atlanta, Missouri, and his trophy antelope. Hunt donated by Dr. Gary Ross, NAEBA member from Albuquerque, New Mexico. Larry bought all the donated hunts at the last NAEBA fund raising auction in Denver.

# TIMBERLINE RANCH

*thanks*

*Ray Matejcek and Bruce Woods  
for supporting NAEBA in the  
Fall Satellite Sale.*

*Congratulations on their purchase  
of the top selling animals in the sale.*

Ray Matejcek - TLR #84

**Top Selling Bull**  
Lot #19

Bruce Woods - TLR #743

**Top Selling Cow**  
Lot #18

Bruce Woods - TLR #164

**Top Selling Heifer**  
Lot #21

## NAEBA Membership Contest Standings

(Points Earned through 11/26/92)

62.5 Points - Rush Johnson	5 Points - Doug Marcy
13 Points - Craig Stefanko	5 Points - Doug Leitch
11 Points - Sam Withiam	5 Points - Dale Michel
8 Points - Bob Johnson, Jr.	4 Points - Rod Schmidt
6 Points - Steve & Julie Killorn	3 Points - Deitmar Huber
6 Points - Steve McGrath	3 Points - Michael Ferguson
6 Points - Judie Huber	3 Points - Brian MacCarty
5 Points - Harvey Brubacher	3 Points - Steve Wolcott
5 Points - Gene Drazo	3 Points - Roger Prock
5 Points - Steve Dugan	3 Points - Bob Spoklie
5 Points - Pete Lies	2.5 Points - Larry Wilcox
5 Points - Doug Surine	2.5 Points - Ralph Holcomb
5 Points - Bill Ward	2.5 Points - Dave Whittlesey
5 Points - Cecil Baldwin	

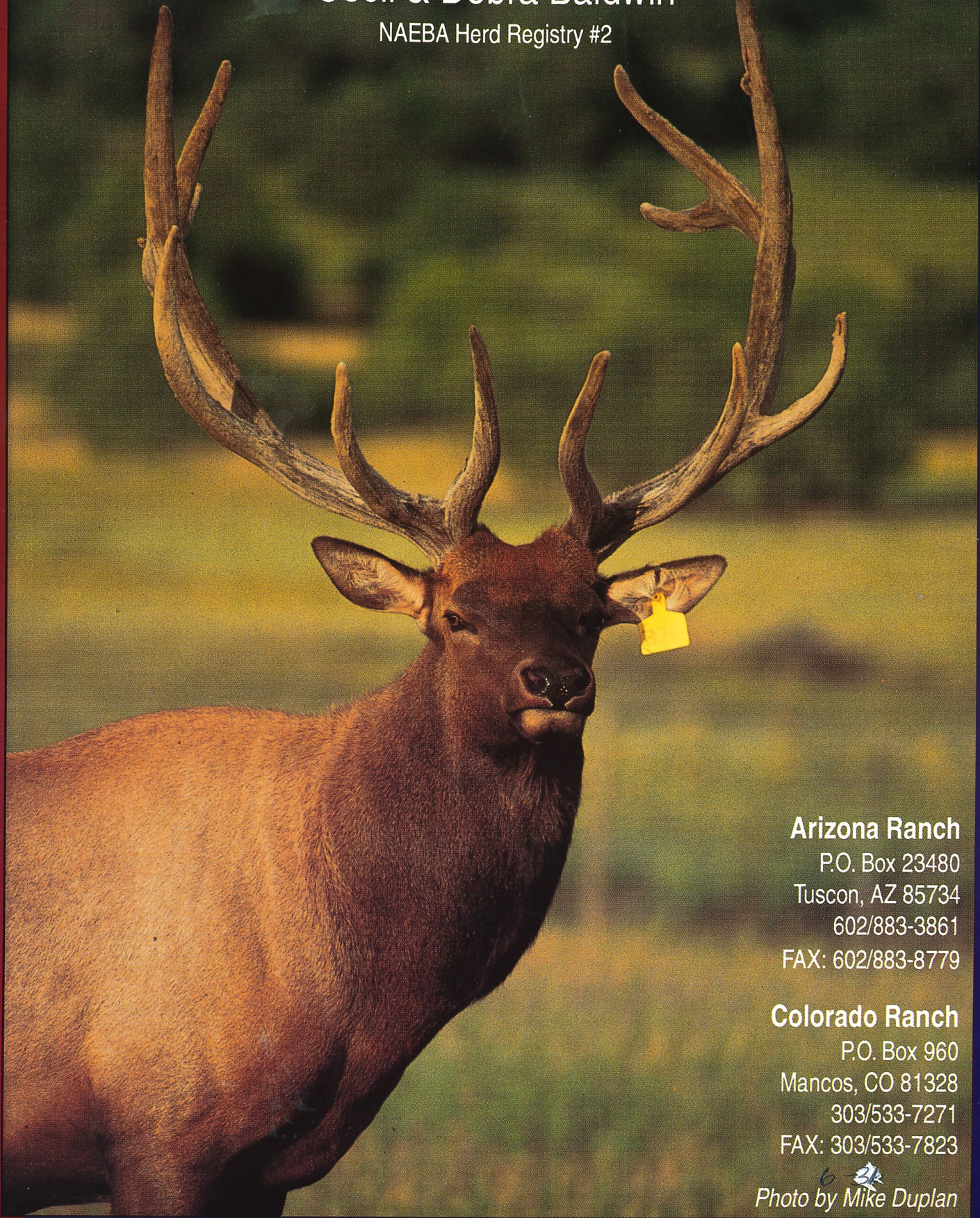
- The membership contest is open to any NAEBA member.
- The winner of the contest will be the person who has the most points to his credit at the end of the contest. The second place will have the second most points and the third place winner will be the person with the third most points.
- The contest will cover the dates of April 1, 1992 through December 31, 1992, inclusive.
- Points will be awarded as follows: 10 points = Lifetime Membership; 5 points = Active Membership; 3 points = Associate Membership; 1 point = Junior Membership
- Points will be determined by the name appearing as "Referred By:" on each new membership application received by the NAEBA office. (Your name must appear on the membership application under "Referred By:" to receive credit for membership.)
- Points will be awarded for NEW MEMBERSHIPS only, no points will be awarded for renewals on existing memberships.
- Prize winners will be determined by the Membership Committee, award winners will be announced in the NAEBA Journal.



# RANCHO VENILDO

Cecil & Debra Baldwin

NAEBA Herd Registry #2



## Arizona Ranch

P.O. Box 23480  
Tucson, AZ 85734  
602/883-3861  
FAX: 602/883-8779

## Colorado Ranch

P.O. Box 960  
Mancos, CO 81328  
303/533-7271  
FAX: 303/533-7823

  
Photo by Mike Duplan

# Trace Mineral Nutrition of Grazing Ruminants

Submitted by Craig Stefanko, Michigan

Seldom are trace mineral deficiencies so severe that grazing ruminants will show clinical deficiency symptoms. In the past, this has mistakenly lead many producers to questions the value of feeding trace minerals on pasture. However, recent research has shown that even marginal trace mineral deficiencies can depress growth, reproduction and the immune system. In addition, in many cases where significant responses to trace mineral supplementation have occurred, analyzing the forage would not have predicted a deficiency. At least eight trace minerals have been shown to be essential nutrients for grazing ruminants. This review will not cover all eight, but will focus on those where our understanding of subclinical deficiencies has increased recently.

## Trace Mineral Availability

Accurately estimating the intake and availability of individual nutrients is very difficult under grazing conditions. First, a crude estimate of forage intake is usually the best producers can do under practical conditions. Secondly, handclipped forage samples may not be representative of what the animals actually consume. Ruminants exercise a great deal of selectivity in not only where they graze, but also in the portion of the standing herbage consumed. Finally, the availability of the individual trace minerals in the forage is difficult to predict.

Kincaid and Cronrathe (1983) reported that much of the copper, zinc and iron in grass silage and alfalfa hay was associated with the neutral detergent fiber (NDF) fraction. In this situation, increasing plant maturity and high levels of feed intake will tend to decrease NDF digestibility and thus reduce the availability of these trace minerals. Whitehead et al. (185) found that 93.8, 45.4 and 40.6 percent of the manganese, zinc and copper, respectively, were bound to the NDF in white clover. If NDF digestibility is high, then much of these minerals should become available. In contrast, an over-estimation of available trace minerals could easily occur due to low NDF digestibility.

Emanuele and Staples (1990) measure the ruminal release of copper and zinc from several different forages after 72 hours of incubation in the rumen. These values should reflect maximum availability because 72 hours is approximately twice the normal residence time in the rumen. In this study, ruminal release of copper and zinc was 75.8 and 62.1 percent for bermudagrass and 92.9 and 79.4 for alfalfa. These data also demonstrate that it is very difficult to ascribe an average availability value across all minerals and forages and have it be meaningful for estimating the amount of an individual trace mineral available from the forage.

## Interactions of Trace Minerals

Once a mineral is solubilized either in the rumen or small

intestine, several factors affect how readily it is absorbed. Interaction with other minerals and bacterial cells can have a great impact on absorption. For example, it has been known that molybdenum can depress copper absorption in grazing ruminants. However, only recently have we understood the role of sulfur in intensifying the interaction of molybdenum and copper. Sulfur has its affect by forming thiomolybdates in the rumen. (Gooneratne et al., 1989). In a recent review, Spears (1991) described the following reactions involved in the formation of thiomolybdates which inhibit copper metabolism.

1.  $\text{MoO}_4^- + \text{H}^+ \text{HS}^- \rightarrow \text{H}_2\text{O} + \text{MoO}_3\text{S}^-$  (monothiomolybdate)
2.  $\text{MoO}_3\text{S}^- + \text{H}^+ \text{HS}^- \rightarrow \text{H}_2\text{O} + \text{MoO}_2\text{S}_2^-$  (dithiomolybdate)
3.  $\text{MoO}_2\text{S}_2^- + \text{H}^+ \text{HS}^- \rightarrow \text{H}_2\text{O} + \text{MoOS}_3^-$  (trithiomolybdate)
4.  $\text{MoOS}_3^- + \text{H}^+ \text{HS}^- \rightarrow \text{H}_2\text{O} + \text{MoS}_4^-$  (tetrathiomolybdate)

Thiomolybdates bind with copper in the rumen to form insoluble complexes which are poorly absorbed. However, some thiomolybdates are absorbed and affect copper metabolism in the body (Gooneratne et al., 1989). It has been discovered that thiomolybdates cause copper to be bound to blood albumins which renders the copper unavailable for any biochemical reaction in the body. Price (1987) reported the tri- and tetrathiomolybdates were the sulfur-molybdenum complexes responsible for reducing copper absorption while the di- and trithiomolybdates had the greatest effect on copper metabolism in the body. These data show how important it is in evaluating the copper intakes of ruminants, to not only consider the amount of molybdenum, but also the sulfur in the diet.

When evaluating mineral interactions it is essential to consider not only the feed but also minerals in the water. For example, Smart et al., (1986) found that reducing the sulfate content of drinking water from 500 to 42 mg per liter, increased copper availability. This effect is independent of molybdenum, and probably results from the formation of insoluble copper sulfide. Ivan (1988) proposed that rumen protozoa were important to this reaction. It appears that the protozoa degrade sulfur amino acids to sulfide which then reacts with the copper to form an insoluble complex.

Iron, although an essential nutrient, at high levels can also impair copper metabolism in grazing ruminants. Even through iron concentrations in the forage and water are in the normal range, when grazing short grass enough soil ingestion can occur that iron intake can become toxic. Usually iron toxicity does not reduce growth, fertility or changes in hair pigmentation commonly associated with copper deficiency. However, iron-induced copper depletion can cause damage to the pancreas and reduce the ability of immune systems to kill invading organisms.

## Trace Minerals to Prevent Toxicity

In grazing situations it is impossible to remove a potentially toxic element from the forage or soil. In these situations, the producer is left with only two practical alternatives. First to supplement the diet with feed low in the toxic element. This is usually expensive and labor intensive. The second approach is to supplement with elements that will reduce the absorption of the toxic element. This requires knowledge of the mineral interactions involved and broad range of safety for the mineral being added.

A good example of this approach is with molybdenum toxicity. Molybdenum toxicity usually occurs when the diet contains more than 20 ppm of molybdenum. Copper supplementation has been used to reduce toxicity in these situations. However, recent research suggests that diets containing as low as 5 ppm molybdenum may benefit from copper supplementation. In these trials, copper deficiency symptoms such as reduce growth, loss of hair pigmentation and infertility in heifers resulted when only 5 ppm of molybdenum were added (Phillippo et al., 1987a).

Recently, there has been a great deal of interest in the affect of copper on curing infertility problems in beef herds. The data of Phillippos et al., (1987b) suggest that some of this response may be from preventing molybdenum toxicity. Conception rates in heifers fed 5 ppm molybdenum was only 12 to 33% compared to 57 to 80% in control heifers. In addition, heifers fed molybdenum were older when they reached puberty and had lower luteinizing hormone concentrations after prostaglandin administration. These changes in fertility occurred even though copper status was not affected. As described above, copper and molybdenum can form an insoluble complex in the rumen. Copper oxide has proven to have low bioavailability in ruminants and would not be an appropriate copper source in this case. Other copper salts should be equally effective.

## Trace Minerals to Enhance Immune Function

Often grazing ruminants are removed from pasture and finished in feedlots prior to slaughter. Feedlot operators have noticed less disease tolerance in animals purchased from areas known to be marginal in some of the trace minerals. Suttle and Jones (1989) reviewed literature showing the selenium, copper, zinc and cobalt deficiencies had been shown to weaken the immune system.

Kott et al., (1983) reported that death losses from birth to weaning were reduced from 12.6 to 4.3% in lambs born to ewes fed

marginally selenium deficient diets and given monthly injections of 4 mg selenium. Spears et al., (1986) showed in a two-year study with beef cows and calves receiving pasture and corn silage marginally deficient in selenium (0.3 to 0.5 ppm) that bimonthly selenium-vitamin E injections reduced death losses from 15.3 to 4.2%. Diarrhea and subsequent unthriftiness was the cause of most deaths. In neither of these studies, were actual selenium deficient symptoms observed.

Similar results have been observed with a cobalt deficiency. Neutrophils, cells critical to the immune system, isolated from ewes or calves deficient in cobalt have reduced ability to kill invading pathogens (MacPherson et al., 1989). Again, cobalt deficiency symptoms were not observed.

These data demonstrate the importance of seriously considering the trace mineral nutrition of grazing ruminants. Feeding trace mineralized salt blocks is the easiest and most effective way of insuring adequate intakes. Marginal deficiencies often cause nonspecific diseases even when the animals do not show clinical deficiency symptoms. Poor health and infertility are common problems associated with marginal trace mineral deficiencies. In numerous experiments, the payback per dollar invested in trace minerals has often been 20:1 or better. In today's competitive environment, trace mineral supplementation of grazing ruminants is one of the best investments a producer can make.

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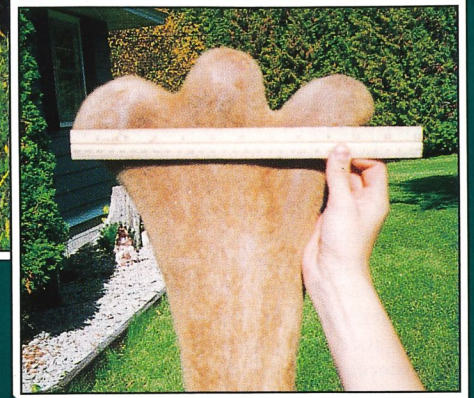
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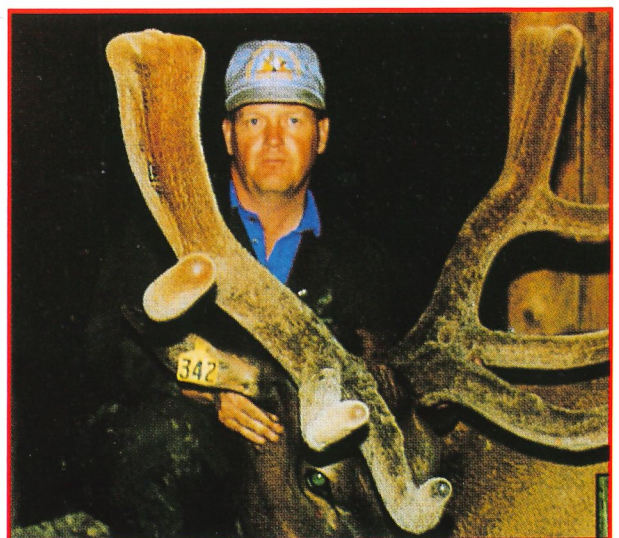
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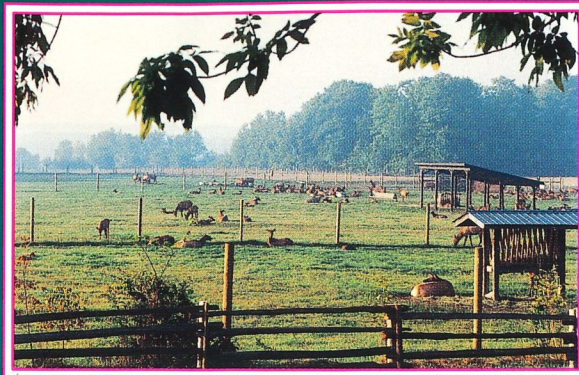


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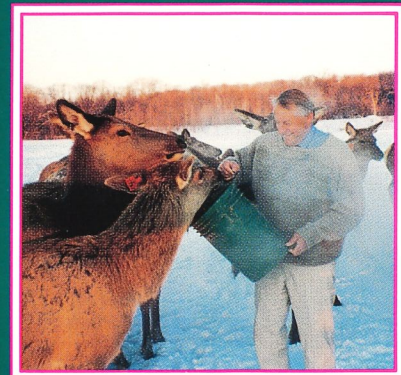
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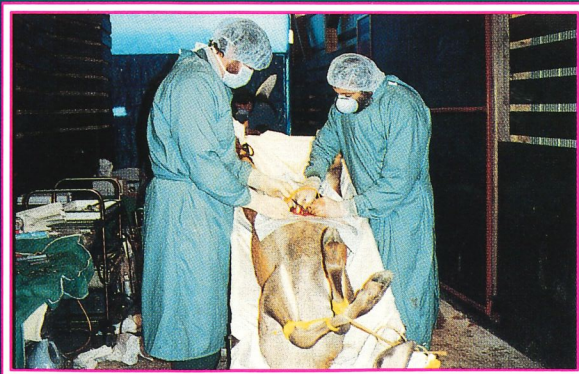
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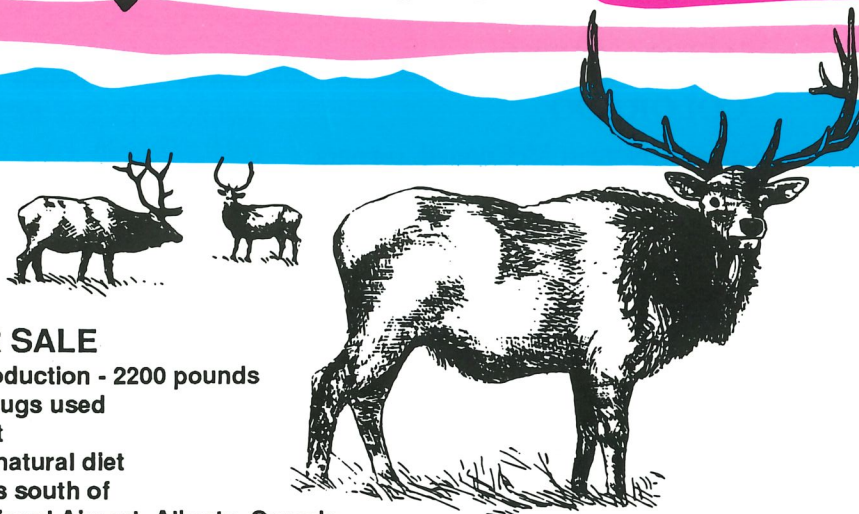
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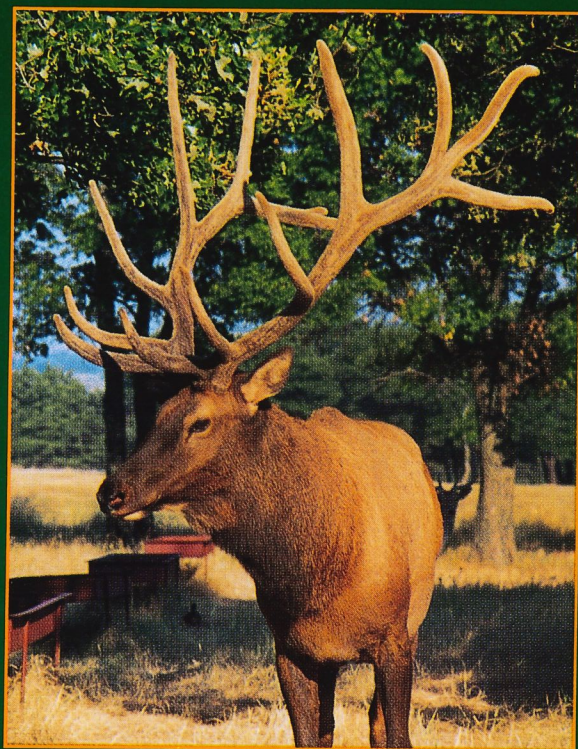
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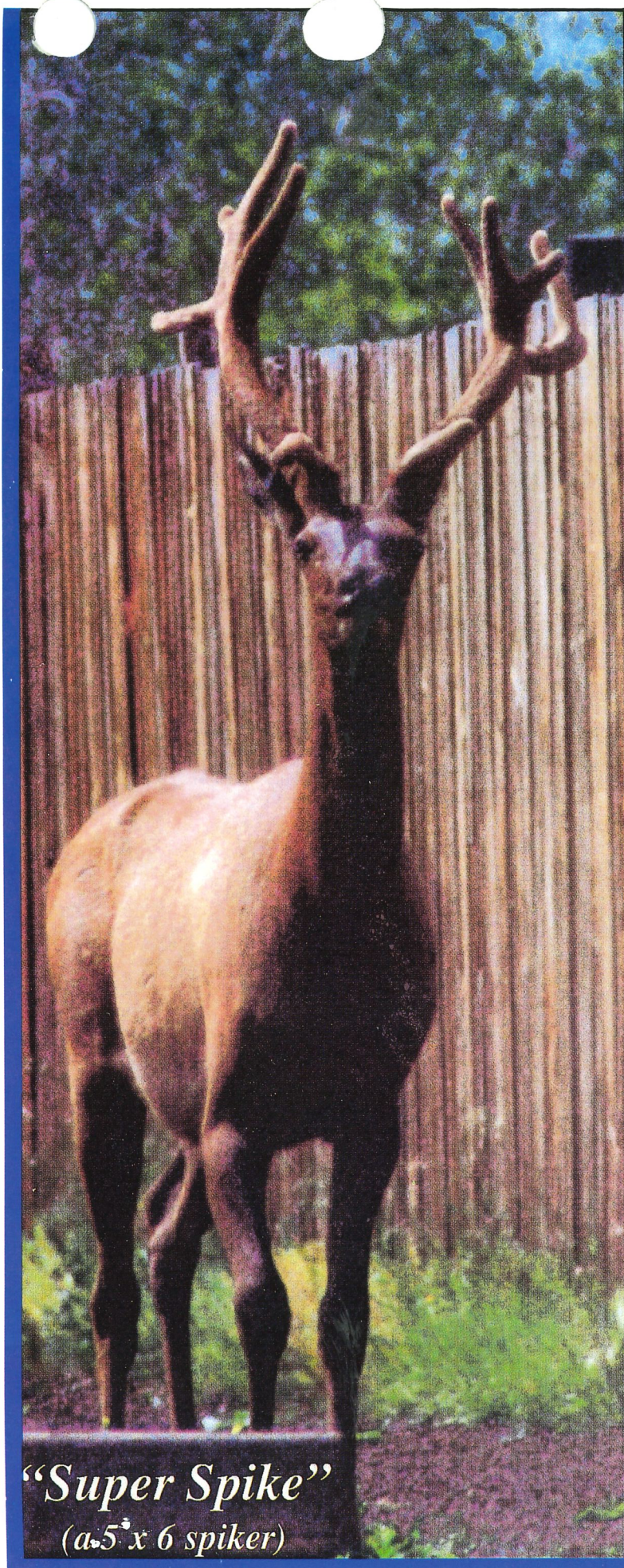
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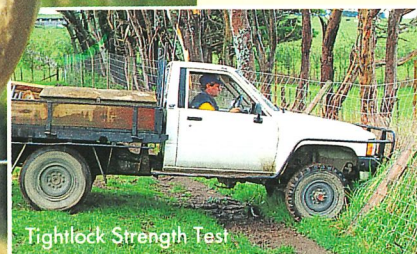
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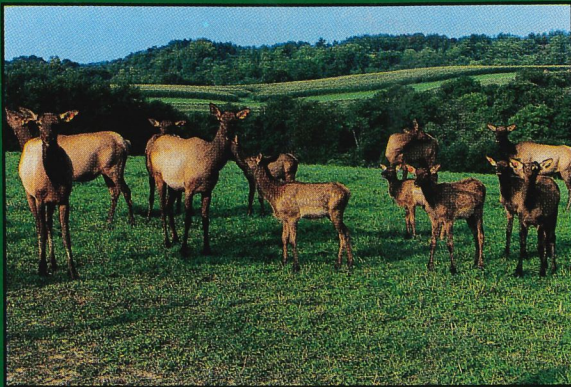
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6-43

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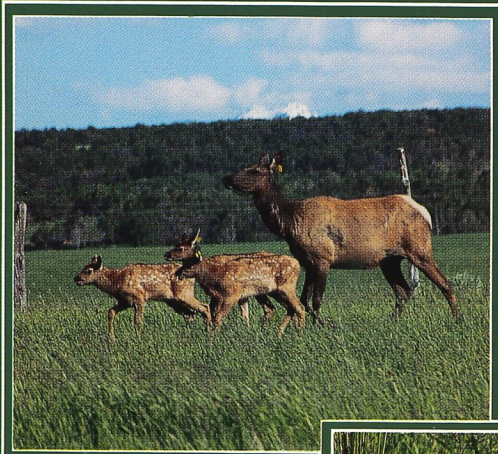
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6-44



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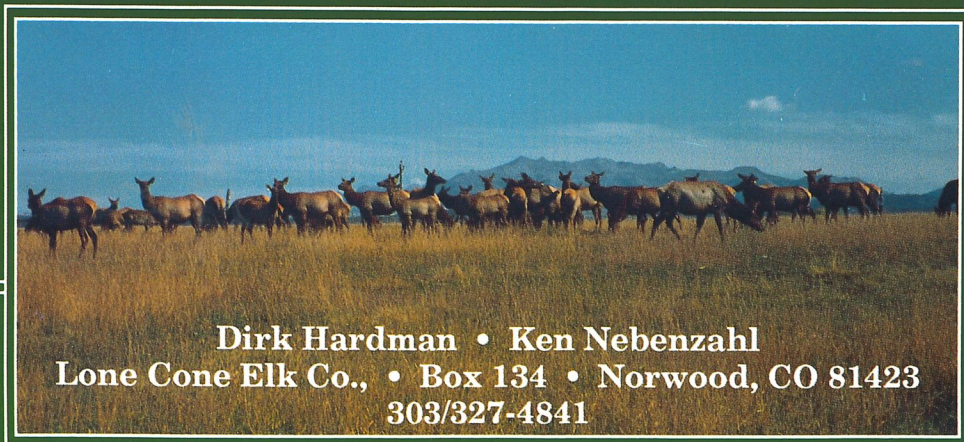


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6-45

January 26, 1993

Gary R. Hathaway  
Elk Ranch  
218 N. Wilson  
Ulysses, KS 67880

Kansas House of Representatives  
Agriculture Committee

Testimony for January 27, 1993

To Members:

I am a resident of Ulysses, Grant County, Kansas, and became involved in elk ranching farming since the fall of 1990 and have produced two calf crops in the year 1991 and 1992 in the State of Kansas and presently have approximately thirteen head of registered purebred elk in the Southwest portion of Grant County, Kansas.

I was attracted to the raising of elk and we were able to utilize some less productive land which was planted to grass. CRP grass native pasture and the corners of a center pivot sprinkler system are ideal for enclosures for elk and deer.

In addition to the breeder market the underlying potential of venison for the United States and particular Kansas is very appealing.

In 1990 the country of New Zealand exported a thousand (1,000) ton of prime cut venison to the United States. At a price of \$5 per pound this has a potential impact of Ten Million Dollars to the United States Market and to Kansas if the venison were available. The country of New Zealand has been a major promoter of venison for the last twenty years.

This potential to the United States and in particular to Kansas which is well suited to the raising of deer and elk by virtue of its climate and land that would be desirable for enclosures of a deer and elk facility and an alternative to other domestic meat products.

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(Page 2)

Since 1990 there have been two other facilities built in my neighboring counties. I feel that the elk and deer industry in its underlying venison products can have a very positive effect on Kansas agriculture.

If you have any questions I would be more than happy to address those.

Sincerely,

Gary R. Hathaway

\\jan02-93\gary.cik

*gourmet*

# V · E · N · I · S · O · N



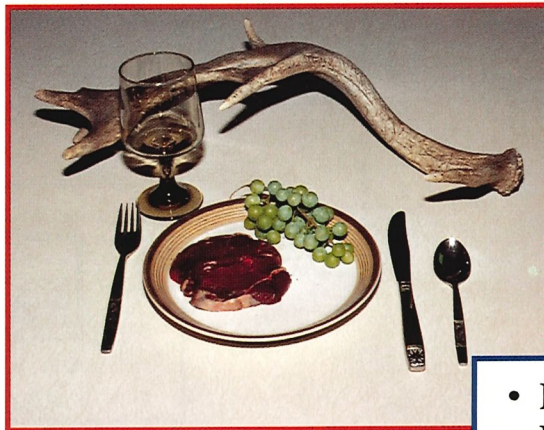
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Lynn Kaufman  
Karen Kaufman  
RR 2 Box 176A  
Moundridge, Kansas  
67107 *HOUSE AGRICULTURE*  
(316)345-8415 *1-27-93*  
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*ATTACHMENT #8*

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STATE OF KANSAS

Animal Health Department

January 27, 1993

Testimony on H.B. 2106

AN ACT concerning domesticated deer; relating to the production thereof.

Presented before the  
Kansas House Committee on Agriculture,  
Rep. Eugene Shore, Chairperson

by  
R. Daniel Walker, DVM  
Kansas Animal Health Commissioner

Mr. Chairman and Distinguished Committee Members:

I want to thank you for this opportunity to testify in support of H.B. 2106. Paramount in the development of good legislation is establishment of the fact that legislation is needed to serve or protect the public interest. Let me list some of the issues that pertain to this matter.

During the last decade increased activity has occurred in the commercialization of captive cervidae (deer and elk farming) as an economically feasible alternative form of agriculture. Animals are not only raised for their value as a source of meat and leather but other markets have developed with an increasing demand for these animals.

Unusual as it may seem, the elk antler is harvested annually each spring and marketed to the Orient for medicinal use. A mature male elk may yield in excess of \$1500 worth of antler per year. The high value of a renewable product such as this obviously increases the demand for breeding stock. Mature female elk have recently been commanding sale prices in excess of \$10,000 each.

In addition to the increased demand for captive domesticated cervidae as a production animal the various deer and elk species have become popular as additions to both public and private exhibitions and collections.

The growth of the domesticated captive cervidae industry has not been without problems. Most notable of these has been the diagnosis of bovine tuberculosis in captive cervidae world wide. Bovine TB is not known to be a problem in wild deer and elk, but of real concern is the scenario in which domestically raised

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animals infected with diseases such as TB, bovine brucellosis, meningeal worms transmit their disease to the wild population. This can be especially disastrous when diseases not known to infect wild species are introduced. Of even more immediate and real concern is the fact that cases have been documented in this country where domesticated elk infected with bovine TB have transmitted the disease to domestic cattle herds. The cost of damage to both cattlemen and elk ranchers alike is enormous. The expense of indemnification to owners of depopulated affected cattle or deer herds is at this time the responsibility of the state in which the infection occurs and has made this a priority issue with few good answers. There are currently approximately 12 domesticated cervadae herds infected with TB in the United States today.

Another concern is that since European Red Deer are sometimes cross bred with domesticated North American wild elk (for commercial reasons) the risk exists that hybrids from this cross could stray or be released to the wild, co-mingling and breeding with native wild populations and adulterating pristine native elk gene pools.

With elk selling prices in the thousands of dollars wild native herds have been the target of professional game poachers as they can not be distinguished from domesticated species. Poached animals are easily sold in this largely under regulated industry.

As you can see, the scope of this issue is large. H.B. 2106 is a timely and appropriate piece of legislation. I would respectfully request that this bill be refined to give the commissioner a more specific legislative directive. I would have several recommendations on the details of this bill.

I plan to bring to this legislative session my proposals for certain Animal Health Department organizational changes that will enable the agency to adjust and grow as the agencies mission of public service changes. This legislation will fit in well with those proposals.

I stand for questions.

Respectfully submitted,



R. Daniel Walker, DVM  
Kansas Animal Health Commissioner



Associated Press

Jim Rich tends to his herd of 600 exotic deer in Washington state. New state regulations threaten the Riches' livelihood.

# This is no game

## Ranchers, regulators at odds over wildlife farming

By James L. Eng  
Associated Press

ACME, Wash. — Jim and Anita Rich were making a go of it much the way frontier settlers did, tending a farm on 80 acres of a sloppy-wet valley in northwestern Washington.

But the Riches weren't raising crops or cows. They were raising exotic deer, 600 of them, for sale and for slaughter.

The future of that herd is in doubt.

The Riches moved from Virginia four years ago and started the Pacific Northwest's first large-scale commercial deer farm on land that once yielded corn, hay and peas. This was to be their first profitable year. Instead, they could lose their farm and their livelihood.

The state Department of Wildlife imposed emergency regulations this summer banning the importation, sale and transfer within the state of most deer, elk and other animals commonly used in wildlife ranching and farming operations. The regulations halted a budding game-farm industry in its tracks.

The Wildlife Department says the regulations are necessary to prevent game-farm animals from spreading diseases to, interbreeding with and competing with native wild animals.

"We were trying to get out in front of this because this is an emerging industry," says Curt Smith, director of the state Wildlife Department. "We don't know for sure whether we have a problem in this state, but animals have come here from states that have diseases."

Jim Rich accuses Smith of overreacting and of zealously crusading to wipe out the game-farm industry across the nation.

Last spring, the Riches locked up tens of thousands of dollars in sales for sika breeding doe, at \$1,500 to \$1,700 a head. They were negotiating with a Japanese company to expand their operation by 40 to 60 acres and penetrate Pacific Rim markets.

But the Japanese deal fell through, the new state regulations scared away customers, and Rich says he's left with 600 animals nobody wants.

Across the Wild West, states have been cracking down on a blossoming game-farm industry. Wyoming has essentially outlawed big-game farms. California imposed emergency regulations shortly after Washington did. Oregon is considering draft regulations.

No state wants to be a game-farm dumping ground, says Chris Wheaton, big-game staff biologist for the Oregon Department of Fish and Wildlife.

## Strictures on game farms mullied

By Steve Painter  
The Wichita Eagle

The Kansas Department of Wildlife and Parks is studying recommendations to tighten restrictions on game farmers, said Bill Hlavachick, chief of the department's wildlife management section.

The agency is most concerned about the spread of tuberculosis from elk and deer to native populations of those species and to cattle, and the potential spread of a brain worm from eastern deer species to mule deer.

"Game ranching, particularly big game like elk, is really growing by leaps and bounds," he said. "That seems to be where the big money is."

Anyone who raises game animals for sale

is required to have a permit from the department. "But it's not a real tight thing," Hlavachick said.

He recently headed a committee of Wildlife and Parks employees that, in October, recommended several ways of tightening regulations on game farming. Those regulations, which Hlavachick declined to detail, are awaiting action in the department, he said.

The meningeal worm, to which eastern deer have developed a resistance, destroys the casing around a deer's brain. The disease would be virtually 100 percent fatal for mule deer, which have no natural resistance to it, he said.

"The Great Plains have traditionally been a barrier to these things," he said.

In Colorado and Montana, several elk herds were destroyed last year because of tuberculosis infection. The source was traced to Nebraska, where a rancher sold infected elk in the late 1980s to buyers in Colorado and Montana.

About 2,500 game-farm animals were destroyed in Alberta, Canada, following an outbreak of TB in December 1991.

"What you're seeing now is recognition by various wildlife departments in the Western United States and also in Canada, not that they have been turning a blind eye, but just that they were unaware of what's going on and now they realize there are some valid concerns for wildlife," says Margo Pybus, wildlife disease research biologist with the Alberta Fish and Wildlife Division.

No one knows exactly how many game farms there are, but most of the Western states have seen an explosion in the industry since the mid-1980s. Many were seeking to cash in on the success of farmers in New Zealand, a country with no native deer species. Deer were imported into the country in the past century, and their numbers multiplied so fast that ranchers began raising them for profit.

Game farmers such as Rich make money primarily by selling breeding doe to others looking to get into the business. The two other major customers are restaurants, which buy deer meat, and Asian countries, where elk

velvet antlers are prized as medicine.

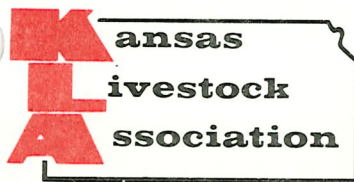
Rich says that when he started his business in 1988, he told the state Wildlife and Agriculture departments of his plans and tested all his animals for TB and brucellosis. He quarantined his farm until his animals got a clean bill of health.

The Wildlife Department didn't express any interest then, so Rich says he was perplexed when the department proposed emergency regulations during the summer.

Smith says the department wasn't aware of the scope of the potential problems until the fall of 1991, when state wildlife directors met in Arkansas and swapped stories of game-farm woes in their states.

But even Smith acknowledges that of the three game-farm threats he cites — spread of TB and other diseases to animals in the wild, interbreeding with wild animals and competing for their habitat — not a single case has ever occurred in Washington.

In fact, there has never been a confirmed case of bovine TB — a lung disease found mostly in cows — in wildlife in the United States, says Mitch Essey, senior staff veterinarian with the cattle diseases and surveillance staff at the U.S. Department of Agriculture's Animal and Plant Health Inspection Service.



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January 27, 1993

**TO:** House Agriculture Committee  
Representative Gene Shore, Chairman

**FROM:** Mike Beam, Executive Secretary, Cow-Calf/Stocker Division

**RE:** House Bill 2106, Concerning Domestic Deer

The Kansas Livestock Association supports this effort to give the Kansas Animal Health Department regulatory authority in the production of domestic deer. In addition, our association's policy supports the department's ability to regulate other "exotic animals and birds" which pose disease threat to the livestock industry. By exotic animals, I am referring to domesticated deer, elk, llamas, ostriches, wild pigs or other animals that may be raised, sold and transported by private individuals.

During last year's session, a companion animal bill included language giving the Animal Health Department authority to issue rules and regulations for exotic animals. This bill was vetoed, but not because of this provision. We encourage this committee to consider addressing this issue again in HB 2106.

Most of the provisions of the bill pertain to expanding the definition of livestock in statutes dealing with the Kansas Animal Health Department, Kansas Department of Wildlife and Parks and the meat inspection area regulated by the Kansas State Board of Agriculture and the livestock theft forfeiture law passed last year.

I suggest the committee include references to domestic deer and exotic animals in the statutes pertaining to livestock diseases. Article 6 of Chapter 47, explains the Kansas Animal Health Department's authority to quarantine infected animals, regulate interstate movement of livestock, the ability to test individual animals or herds suspected to be infected with contagious diseases and other disease control programs. We don't claim to be an expert on drafting laws, but I would encourage the committee and your staff to consider including regulatory language for exotic animals in Article 6 of Chapter 47.

Mr. Chairman, we suggest the committee consider broadening the scope of the bill to allow the livestock commissioner and Kansas Animal Health Department to issue the rules and regulations necessary to control diseases in exotic animals. We stand ready to cooperate and assist the committee in this effort.

Thank you.

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HOUSE BILL NO. 2106

HOUSE COMMITTEE ON AGRICULTURE

January 27, 1993

Mr. Chairman, Members of the House Committee on Agriculture, my name is Larry D. Woodson, Director of the Division of Inspections, Kansas State Board of Agriculture and I appear today on House Bill 2106 regarding domesticated deer and elk farming.

My testimony is directed at K.S.A. 65-6a18 relative to the Kansas Meat and Poultry Inspection Act.

The authority for the Kansas Meat and Poultry Inspection Act was established by the Federal Wholesome Meat Act of 1967. Title III, Section 301 addresses Federal State Cooperation and provides 50:50 funding to states that operate inspection programs "equal to federal".

My purpose in citing this Act is to call your attention to the provisions of Section 301 that addresses the amenable species i.e. cattle, sheep, swine, goats, or equine and the processing for intra state commerce. Species not addressed in this section fall under 7 U.S.C. 1622; 7 CFR 2.17, 2.55 or Voluntary Inspection and Certification.

The significance of Voluntary Inspection for non-amenable species is that inspection is performed on a fee basis. Species slaughtered that are not amenable do not qualify for 50:50 funding. Thus, buffaloes, rabbits and, if passed, deer and elk are slaughtered without federal matching funds.

There are two options available for Kansas: 1) establish a voluntary inspection section and charge inspection fees for non-amenable species; or 2) continue the existing program of mandating the inspection of certain species and providing inspection at state cost (no matching funds) for those animals entering commerce.

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An inspection fee does place an additional burden on those animals or products and makes it difficult for them to compete in the marketplace.

By providing the inspection, it does encourage the development of this type of business in Kansas.

One of the ironies of the Wholesome Meat Act is that they consider buffaloes as game animals. Buffalo slaughtered in Kansas are all raised domestically and one survey estimated there were some 80 buffalo raisers in Kansas. Three hundred forty-two buffalo were slaughtered under Kansas Inspection in 1992. Of that amount, most would be hobby raisers with very small numbers. there are less than ten commercial herds in Kansas.

As there is more interest in deer and elk ranching, the number of animals offered for slaughter will increase but the volume will likely remain relatively small compared to cattle, swine and sheep.

I would anticipate a request in the future relative to other exotic species that will want to sell their products for food.

We know that llamas, ostriches, emus, and other animals have already been started in Kansas. These too will be offered for sale and require inspection services.

In conclusion, I mainly wanted to alert the committee as to the ramifications of including deer, elk or other exotic species under the Kansas Meat and Poultry Inspection Act.

I stand for questions.



Joan Finney  
Governor

## DEPARTMENT OF WILDLIFE &amp; PARKS

Theodore D. Ensley  
Secretary

## OFFICE OF THE SECRETARY

900 SW Jackson St., Suite 502 / Topeka, Kansas 66612 - 1233  
(913) 296-2281 / FAX (913) 296-6953

## H.B. 2106

TESTIMONY PRESENTED TO: HOUSE AGRICULTURE COMMITTEE  
PROVIDED BY: KANSAS DEPARTMENT OF WILDLIFE AND PARKS  
JANUARY 27, 1993

H.B. 2106 would provide authority to the Livestock Commissioner to issue domesticated deer permits and to administer a permit program through rules and regulations. A permit fee not to exceed \$100 would be established by the Livestock Commissioner through rules and regulations. Domesticated deer is defined as any cervidae raised in confinement for breeding or for the carcass, skin or part. Domesticated deer are excepted from the definition of a big game animal.

Individuals raising domesticated deer are exempted from the game breeder permit requirement as administered by the KDWP. Persons engaged in raising domesticated deer are exempted from the illegal commercialization of wildlife statute.

The Department of Wildlife and Parks has serious reservations concerning the provisions of this bill. This Department has met with the Animal Health Department, U. S. Fish and Wildlife Service and the state Board of Agriculture to discuss broad problems presented by the increase in big game ranching both in Kansas and throughout the United States. Administration of a permit program is considered necessary and throughout the country it is generally administered by the state wildlife agency. Administration of the Kansas program by a department other than the KDWP has been discussed, but no agreement or consensus reached.

At this time, the KDWP would prefer to maintain the permit program as a part of the Game Breeder Permit program. Continued discussions with other departments should occur and any changes should be performed in accordance with an overall plan prepared to address the entire big game ranching issue. Several of the

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issues involved include: disease control and health checks, effects on wild big game populations, exotics, illegal activities, cooperative efforts and animal husbandry considerations.

Many if not all of the issues surrounding big game ranching directly apply to the missions, goals and objectives of this Department. The bill as written may remove our authority to be involved with "domesticated deer" as a natural resource issue.

It is our recommendation that the communications which have started between the several responsible departments be allowed to continue. This will result in a better planned approach to the big game ranching. Permit administration will be a part of those discussions.

The bill as written poses several other problems and should the Agriculture Committee decide to work the bill, the KDWP would like to make suggestions as follows:

- A definition of "domesticated deer" should include a reference to "legally obtained" deer and "live sales" should be included as a purpose for raising. The definition appears frequently in the bill and should be so adjusted whenever it appears.
- Pg. 3, subsection (a), lines 22-23 - by exempting domesticated deer from the definition of "Wildlife", this may impact our ability to address wildlife issues related to big game ranching. The KDWP recommends that the definition of wildlife not be amended. Such an amendment is not necessary to accomplish what appears to be the objective of this bill.
- K.S.A. 32-805 (Sec. 3, line 18 on pg. 3) establishes definitions that are used throughout KDWP laws and regulations. This was purposely done to avoid redefining the same term over and over. As such, it is not necessary to redefine "domesticated deer" on pg. 5, lines 31-34 and on pg. 7, lines 8-11.



- Pg. 5, subsection (f), lines 29-31 - a game breeders permit is required to raise and sell certain critters. However, the exemption for domesticated deer speaks only to "raising" --- is the selling omission intended?
  
- Pg. 7, subsection (g), lines 7-8 - The proposed language for exempting those involved with raising domesticated deer from the provisions of K.S.A. 32-1005 appears to say that such an individual could violate any of the provisions and be exempt. Subsection (a) of K.S.A. 32-1005 already exempts any legal commercialization of wildlife. The Department recommends that subsection (g) be struck in its entirety.