# ? & A

## BASIC FACTS ABOUT

# MULTIMIN®90


**MULTIMIN®90** Sure Trace Mineral Supplementation by Timed Injection

# MULTIMIN® 90


## WHAT IS MULTIMIN® 90?

**ANSWER:** **MULTIMIN® 90** is Sure Trace Mineral Supplementation given by timed injection. Adequate levels of the essential trace minerals (Zinc, Manganese, Selenium and Copper) as chelates can be injected SC/IM to significantly increase trace mineral status and functions. This is true especially before critical events like drying off, calving, breeding, stress, young growing animals, etc. University studies and trial data show that adequate levels of these essential trace minerals demonstrate increased reproduction efficiency and improved immune response. **MULTIMIN® 90** is not intended as a replacement for minerals in the feed. It is a pretreatment to help prevent trace mineral deficiencies and thus help prevent production and reproduction failures in cattle.

## HOW DOES MULTIMIN® 90 WORK?

**ANSWER:** By injecting **MULTIMIN® 90** a minimum of four weeks before critical events like calving, breeding, and at dry-off and in bulls 90 days before breeding, metalloenzymes levels are enhanced at these critical stages resulting in increased immunocompetence and reproduction efficiency.

## WHY DO YOU NEED MULTIMIN® 90?

**ANSWER:** A variety of factors negatively impact the absorption of orally consumed trace minerals. These can include poor or inadequate trace mineral supplementation strategies, large variations in oral mineral intake and the presence of antagonists in feed, forages, distillers grain and drinking water that reduce the absorption or bio-availability of these critical trace minerals. This reduced absorption or bio-availability makes it difficult, if not impossible, to optimize trace mineral status and functions at critical production periods using only the oral intake route. Injecting **MULTIMIN® 90** before these critical events will help compensate for these negative effects. This will ensure a more optimal trace mineral status and function when needed most such as during calving, breeding, dry-off, weaning and transition periods.

## WHEN DO WE INJECT MULTIMIN® 90?

**ANSWER:** Metalloenzymes usually peak between 25-30 days after essential trace mineral has been injected into the animal. It is therefore recommended that **MULTIMIN® 90** be injected at least 4 weeks before critical/stressful events. **MULTIMIN® 90** is recommended in beef cows 4 weeks before breeding and again 4 weeks before calving. **MULTIMIN® 90** is recommended in dairy cows at dry-off, 4 weeks before calving, and 4 weeks before AI. **MULTIMIN® 90** is recommended in heifers every 3 months and especially 4 weeks before breeding. Calves may be injected with **MULTIMIN® 90** at birth and at 3 months of age and/at weaning. Due to the fact that semen production takes about 2 months and the peak in metalloenzymes takes about 30 days, it is recommended that bulls are injected with **MULTIMIN® 90**, 90 days before breeding/semen collection or at least 3 times a year.

# WHAT ARE THE ECONOMIC BENE FITS OF USING MULTIMIN® 90 IN CATTLE?

**All MULTIMIN® studies are conducted with animals having free access to NRC level or higher levels of trace minerals.**

## BEEF

### Cow/Calf Production

1. A recent study conducted at Kansas State University injecting **MULTIMIN® 90** at pregnancy diagnosis and again 30 days before start of breeding indicated that:
   - Conception to Fixed Time AI was greater in cows receiving **MULTIMIN® 90** (P=0.05) (60.2% vs. 51.2%).
   - Overall pregnancy rate was better in cows receiving **MULTIMIN® 90** (93% vs. 89.9%).
   - Cows receiving **MULTIMIN® 90** had greater body condition score gain between calving and breeding.
   - **MULTIMIN® 90** benefits calving distribution – 77.49% calves were born during the first 20 days of the calving season.
2. In a trial at Texas A&M University cows showed an improvement in pregnancy rate from 81% to 94% (+13%).
3. New trial data from a study by the University of Sao Paulo, Brazil, on the effect of **MULTIMIN®** on the pregnancy rate of crossbred heifers synchronized for timed embryo transfer (FTET) indicated that the subcutaneous injection of **MULTIMIN®** 17 days prior to FTET could increase pregnancy rates by increasing early embryonic survival.

### Stocker/Feeder Cattle Production

1. University studies indicated that including **MULTIMIN®** in a processing protocol in starter and finishing cattle can contribute to:
   - Reduced BRD Treatment
   - Fewer sick animals = less antibiotic use
   - Improved performance (ADG+FEED:GAIN)
   - Reduced transport shrinkage
   - **Better beef quality:**
     - Improved hot carcass weight
     - Larger rib eye area
     - Improved marbling score

***For the complete trial data please visit our website***
**www.MultiminUSA.com**

## DAIRY

1. New study data from Cornell University on a trial conducted on 3 large commercial dairy farms including 1,416 cows, indicated that injecting **MULTIMIN® 90** at dry-off, about 30 days prior to calving, and again 35 days in milk had the following results:
   - **MULTIMIN® 90** injected cows had lower somatic cell counts than the control group, especially in the second lactation cows.
   - **MULTIMIN® 90** injected cows had less stillbirths than the control group (4.3% vs. 6.1%).
   - **MULTIMIN® 90** injected cows had less endometritis than the control group (28.6% vs. 34.2%).
   - **MULTIMIN® 90** injected cows had 50% less displaced abomasums than the control group (1.3% vs. 2.6%).
   - **MULTIMIN® 90** injected cows had less incidence of subclinical mastitis than the control group (8.0% vs. 10.4%)(P=0.005).
   - **MULTIMIN® 90** injected cows had less incidence of clinical mastitis than the control group (18.7% vs. 22.4%)(P=0.14).

Trial data from Cornell University showed Somatic Cell Counts were reduced from 299,660 to 218,964

A significant benefit!

### Return On Investment

This study indicated that using **MULTIMIN® 90** resulted in a net profit between $32 and $42 per cow per year using a bonus average of $0.20 /cwt.

2. Study data compiled by Cornell University also indicated that treatment of dairy cows with **MULTIMIN® 90** reduced the presence in the uterus of bacteria that can be detrimental to uterine health and reproductive performance.

# TRACE MINERALS: WHERE THEY FIT

## KEY

| | |
|---|---|
| Zinc: Zn | Manganese: Mn |
| Selenium: Se | Copper: Cu |

**Optimal trace mineral status of the relevant trace minerals have been shown to increase (▲) or decrease (▼) certain functions/events***

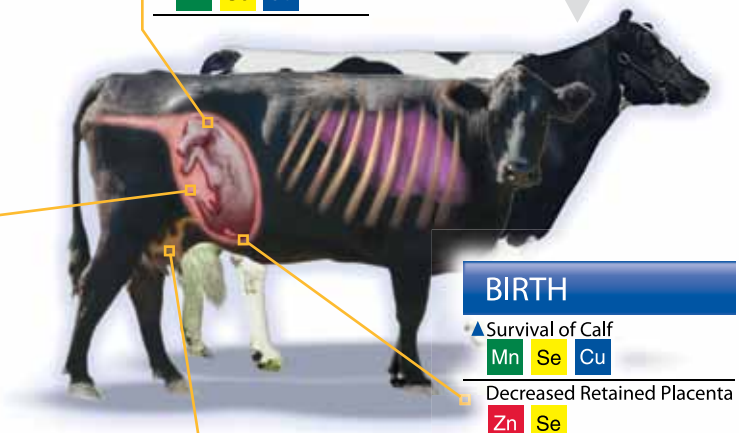
***Data on file**

## FETUS

Development
Zn

Transfer of Immunity
Zn Se Cu

▲Embryo Survival
Mn Se Cu



## BREEDING

▲Female Ovulation/Estrus
Mn Se Cu

▲Male Sperm (Count and Quality)
Zn Mn Se Cu

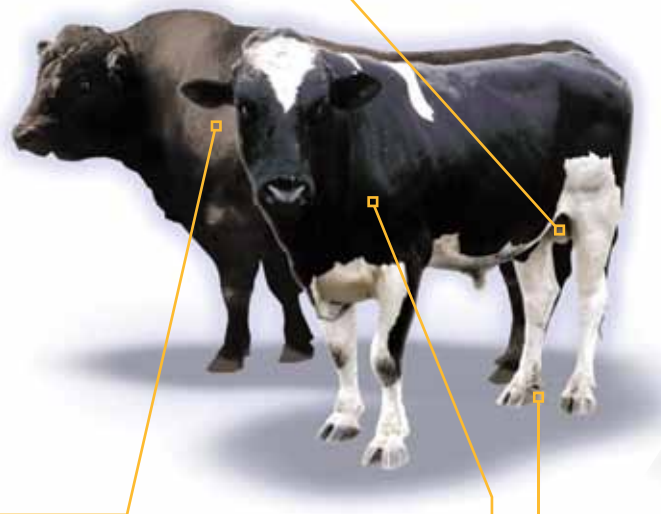
## BIRTH

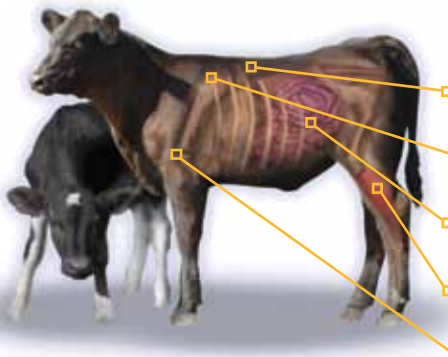
▲Survival of Calf
Mn Se Cu

Decreased Retained Placenta
Zn Se

## LACTATION

Decreased Mastitis/SCC
Zn Se Cu





## GROWTH

▲Appetite
Zn

▼Sway Back
Cu

Cartilage and Bone Formation
Zn Mn Cu

▼Diarrhea
Cu

▼White Muscle Disease
Se

Cell Division
Zn

## STOCKER/FEEDLOT

▲Immunity
Zn Mn Se Cu

▲Efficiency of Vaccines
Zn Mn Se Cu

Antioxidants
Zn Mn Se Cu

## TRACE MINERAL RESPONSIVE CONDITIONS

Skin
Zn

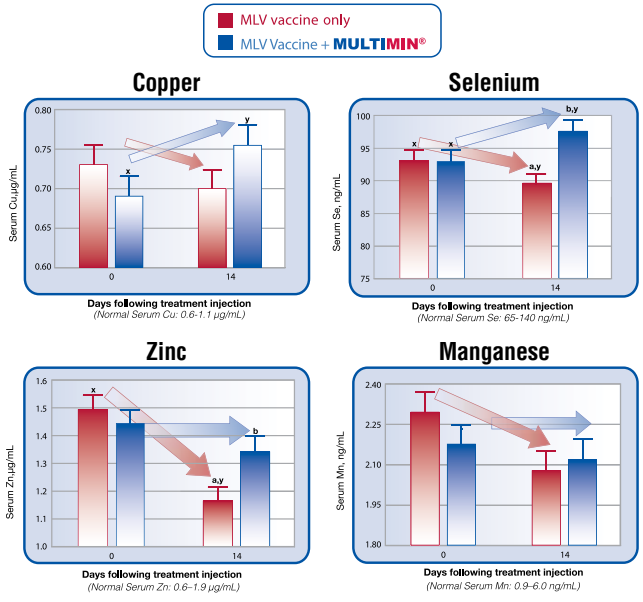
Hair Growth
Zn

Hair Color
Mn Cu

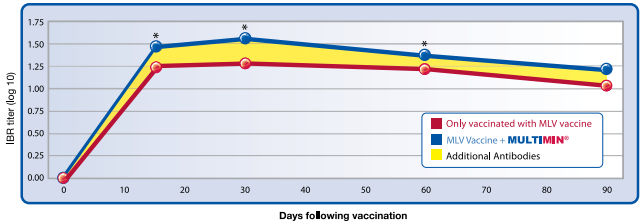
▼Footrot
Zn

## MULTIMIN® + VACCINES: BECAUSE PREVENTING DISEASE=PROFIT!

**Did you know that modified live vaccines negatively affect the trace mineral status of recently vaccinated animals?** This is due to different trace minerals playing an active role in different pathways of the acquired immune response. This may be critical for disease prevention in cattle.

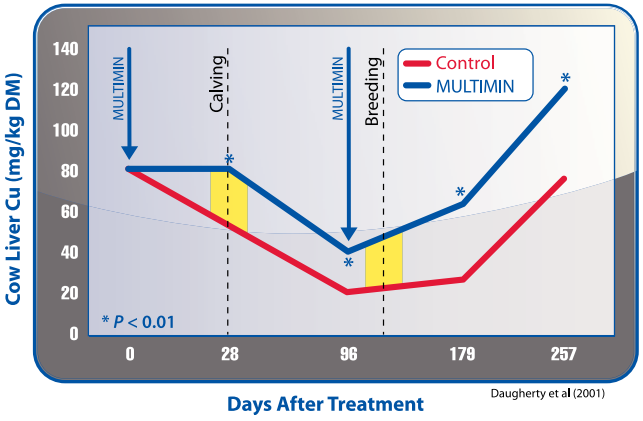



Study data indicated that **MULTIMIN®** treatment at the same time as vaccination maintains/improves the animal's trace mineral status. This may be critical in driving the immune response for better health. Researchers at University of Florida have also reported that the concurrent application of **MULTIMIN®** and modified live vaccines increased the production of neutralizing antibody titers against IBR (Infectious Bovine Rhinotracheitis)/ "Rednose" virus significantly in beef steers as early as 14 days after vaccination, maintaining this difference for at least 60 days.




*Infectious Bovine Rhinotracheitis (IBR) serum titers (log 10) of calves provided a 7 mL injection of trace minerals (ITM) or 7 mL of sterile saline (Control). Seronegative calves vaccinated on Day 0.*
** = Values within day and between treatments differ; P < 0.05.*

## RISK PERIODS IN CATTLE WHERE TRACE MINERAL PRE-TREATMENT MAY BE CRITICAL

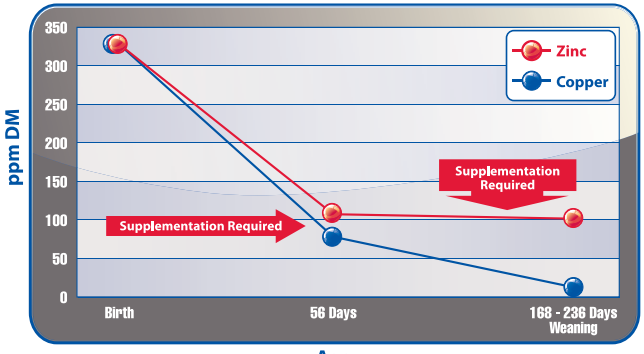



Daugherty et al (2001)

**Elevating mineral status at calving and breeding is critical for:**
**• Calf performance • Cow reproductive performance**

**Effects of Prenatal and Prebreeding Trace Mineral / Vitamin E Injections on Calf Health and Reproductive Performance of Beef Cows.**
*S.R. Daugherty, G.E. Carstens, D.B. Herd, K.S. Barling, and R.D. Randel*
**Department of Animal Science, Texas A&M University, College Station; Department of Large Animal Medicine and Surgery, Texas A&M University, College Station.**

**Calves rapidly deplete the trace minerals they were born with, due to rapid growth rate and the fact that the cow's milk is a poor source of trace minerals**




**Branum, Jay Christopher, "Impact of Prenatal Dietary Copper Level on Copper Status." Submitted to the Office of Graduate Studies of Texas A&M University. May 1999.**

# FUNCTIONS OF THESE ESSENTIAL TRACE MINERALS:

## ZINC


- Reproduction / fertility
- Healthy feet / hooves
- Healthy skin / coat
- Spermatogenesis
- Cell division

**Oral Absorption Rate (coefficient)*: 10-20%**

**Common Antagonists tying up orally supplied Zinc: Calcium, Phosphorus, Iron, Sulfur**

## SELENIUM


- Reproduction / fertility
- Reduced retained placenta
- Disease resistance
- Embryo survival

**Common Antagonists tying up orally supplied Selenium: Calcium, Iron, Sulfur**

## MANGANESE


- Spermatogenesis
- Reproduction / fertility
- Embryo survival
- Ovulation
- Proper bone development

**Oral Absorption Rate (coefficient)*: 0.01-1.2%**

**Common Antagonists tying up orally supplied Manganese: Calcium, Phosphorous, Iron, Sulfur**

## COPPER


- Reproduction / fertility
- Reduced retained placenta
- Disease resistance
- Hair color

**Oral Absorption Rate (coefficient)*: 1-5%**

**Common Antagonists tying up orally supplied Copper: Calcium, Iron, Sulfur, Molybdenum**

*** 2001 INRC**

**USE ONLY IN CATTLE**
**KEEP OUT OF REACH OF CHILDREN**

# MULTIMIN® 90

## (AN INJECTABLE CHELATED SUPPLEMENTAL SOURCE OF ZINC, MANGANESE, SELENIUM AND COPPER)

**CAUTION:**
Federal Law restricts this drug to use by or on the order of a licensed veterinarian.

**GUARANTEED ANALYSIS:**

| | |
|---|---|
| Zinc | 60 mg/mL |
| Manganese | 10 mg/mL |
| Selenium | 5 mg/mL |
| Copper | 15 mg/mL |

**CAUTION:**
Slight local reaction may occur for about 30 sec. after injection. A slight swelling may be observed at injection site for a few days after administration. Use standard aseptic procedures during administration of injections.
*Store Between 15˚C and 30˚C (59˚F and 86˚F). Protect from Light.*

**INGREDIENTS:** Zinc oxide, manganese carbonate, copper carbonate, sodium selenite, disodium EDTA, sodium hydroxide, benzyl alcohol 1% (as preservative).

**DIRECTIONS: USE ONLY IN CATTLE BY SUBCUTANEOUS OR INTRAMUSCULAR INJECTION.**

**DOSAGE RECOMMENDATIONS:**

| | |
|---|---|
| CALVES: up to 1 year | 1mL/per 100 lbs. bodyweight |
| CATTLE: From 1-2 years | 1mL/per 150 lbs. bodyweight |
| CATTLE: Over 2 years | 1mL/per 200 lbs. bodyweight |

**SUPPLEMENTATION PROGRAM:**

| | |
|---|---|
| Bulls | 3 times per year |
| Beef Cows | 4 weeks before breeding<br>4 weeks before calving |
| Dairy Cows | 4 weeks before calving<br>4 weeks before insemination<br>4 weeks before dry-off |
| Calves | at birth<br>at 3 months and/or weaning |
| Heifers | every 3 months – especially 4 weeks before breeding |
| Additional | every 2 months in wet conditions |

(Program gives planned dates that can be varied to suit management programs)

**Packaged in 100 mL**
NDC No. 49920-006-01

**& 500 mL size**
NDC No. 49920-006-05

TAKE TIME OBSERVE LABEL DIRECTIONS

℞ REQUIRED

US PATENT # 7,285,292


MANUFACTURED FOR:
**MULTIMIN NORTH AMERICA, INC**
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