



# Trace Mineral Nutrition and Beef Cattle Health and Productivity

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Dillon MT

Multimin USA

**MULTIMIN<sup>®</sup>90**

SURE Trace Mineral Supply by Timed Injection



# Nutrition

- Fat
- Carbohydrate
- Protein
- Vitamins
- Minerals

# Nutrition

- Fat
- Carbohydrate
- Protein
- Vitamins
- Minerals
  - Macrominerals

# Nutrition

- Fat
- Carbohydrate
- Protein
- Vitamins
- Minerals
  - Macrominerals
  - Microminerals (Trace minerals)



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- Fat
- Carbohydrate
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  - Microminerals (Trace minerals)

Raw Materials

# Nutrition

- Fat
- Carbohydrate
- Protein
- Vitamins
- Minerals
  - Macrominerals
  - Microminerals (Trace minerals)

Tools

## Major Functions of Trace Minerals

### Copper

-embryo

-nervous

-structural

-immune




\*pathogen

\*pathogen killing

\*pathogen cleanup

\*power plant control

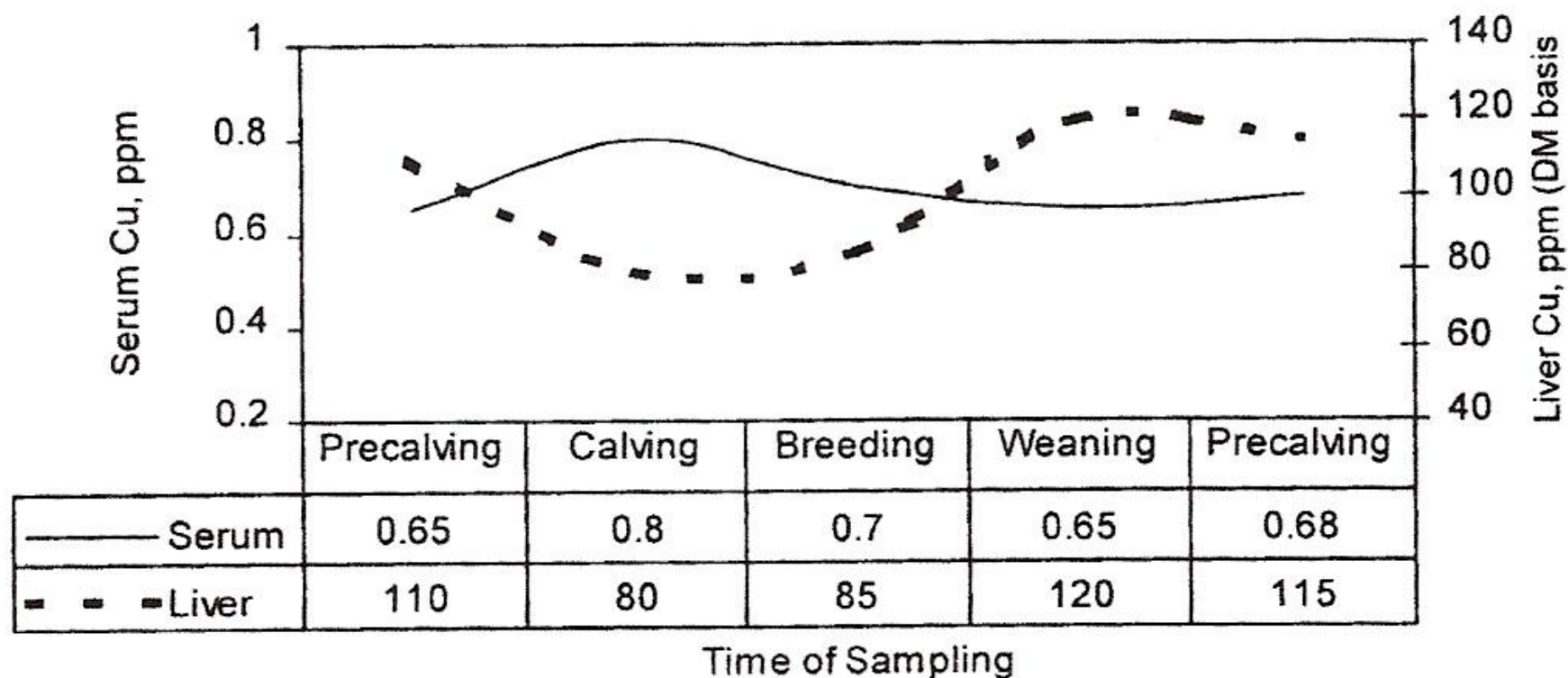
**KEY PARTS OF MANY IMPORTANT ENZYME SYSTEMS, STRUCTURAL COMPONENTS, SYNTHESIS OF REPRODUCTIVE HORMONES, AND BREAKDOWN OF METABOLIC “WASTE” PRODUCTS.**

MULTIMIN <sup>90</sup> Supplies	Major Functions	Major Antagonists	Absorption Coefficient
 <b>Zinc</b> 60mg/mL	<ul style="list-style-type: none"> <li>• Component of more than 300 enzyme systems</li> <li>• Normal testicular development</li> <li>• Normal sperm production</li> <li>• Normal appetite</li> <li>• Proper skin and hoof development</li> <li>• Proper immune system functions</li> </ul>	<b>Calcium</b> <b>Phosphorous</b> <b>Iron</b> <b>Sulphur</b> <b>Fiber</b> <b>Phytates (Soy Beans)</b>	10-20%*
 <b>Mn</b>	<ul style="list-style-type: none"> <li>• Proper production of steroid hormones required for reproduction</li> </ul>	<b>Calcium</b> <b>Phosphorous</b> <b>Iron</b>	0.15-1.2%*
 <b>Copper</b> 15mg/mL	<ul style="list-style-type: none"> <li>• Required for embryo survival</li> <li>• Proper bone formation</li> <li>• Proper nervous system development</li> <li>• Proper immune function</li> </ul>	<b>Calcium</b> <b>Iron</b> <b>Sulphur</b> <b>Molybdenum</b>	1-5%*

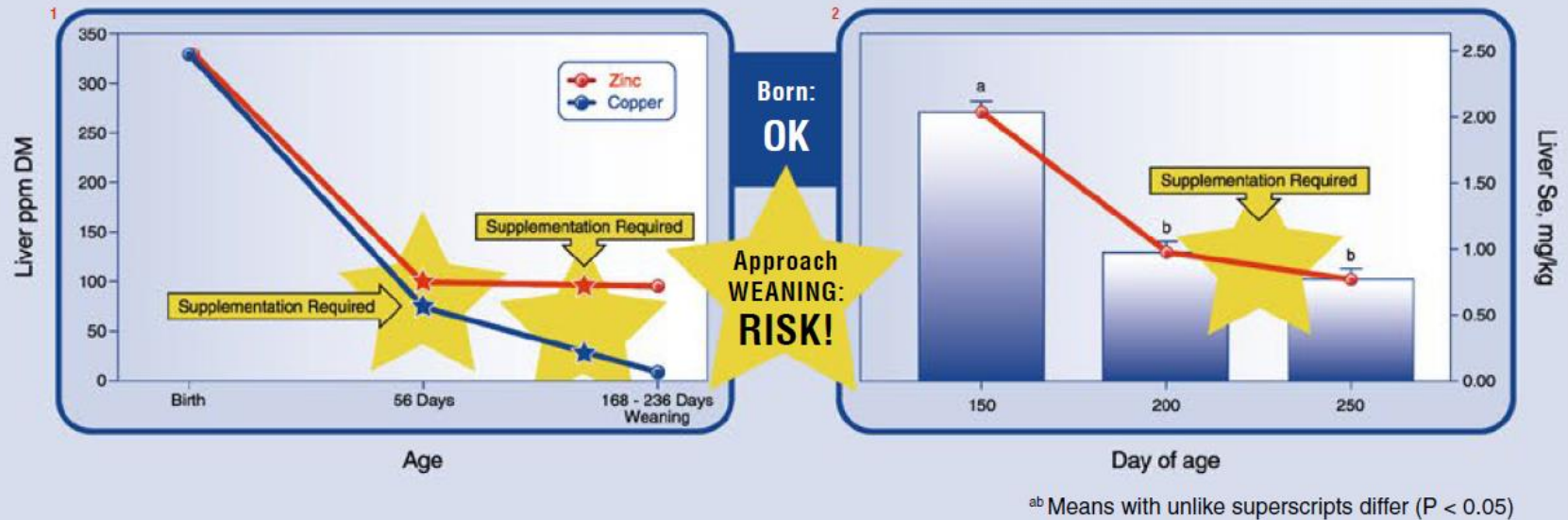
\*NRC 2001



**Figure 3:** Changes in liver and serum copper concentrations for beef cows  
(Swenson, 1998).



# THE CHALLENGE

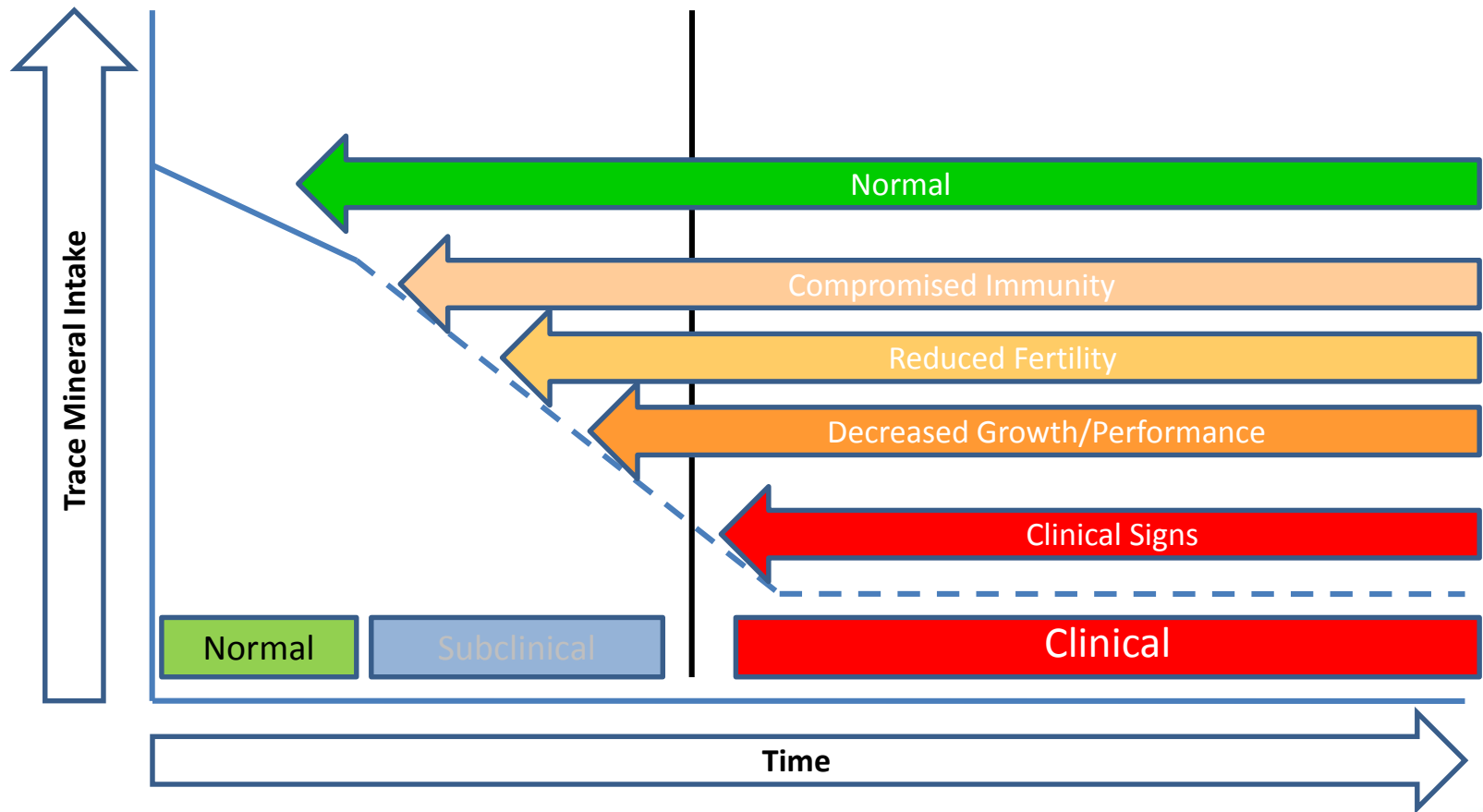


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SURE Trace Mineral Supply by Timed Injection



# Trace Mineral Functions



Wikse, 1992 Texas A&M Beef Cattle Short Course

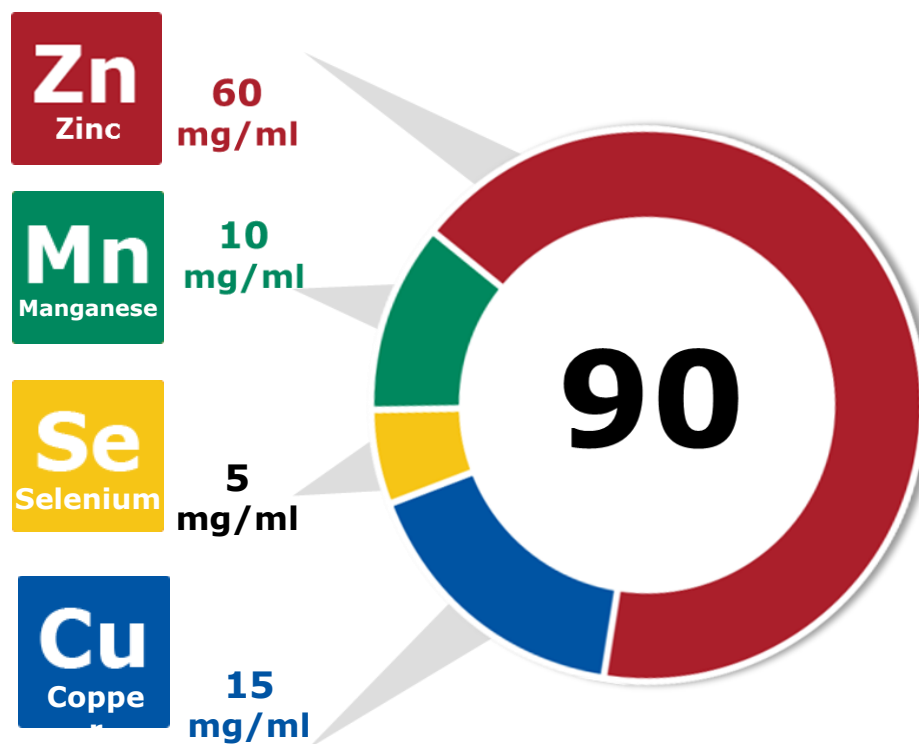
# Injectable Trace Mineral



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**MULTIMIN<sup>®</sup>90** provides **Zinc, Copper, Manganese and Selenium** in a readily available injection



**MULTIMIN<sup>®</sup>90**

**SURE** Trace Mineral Supply by Timed Injection



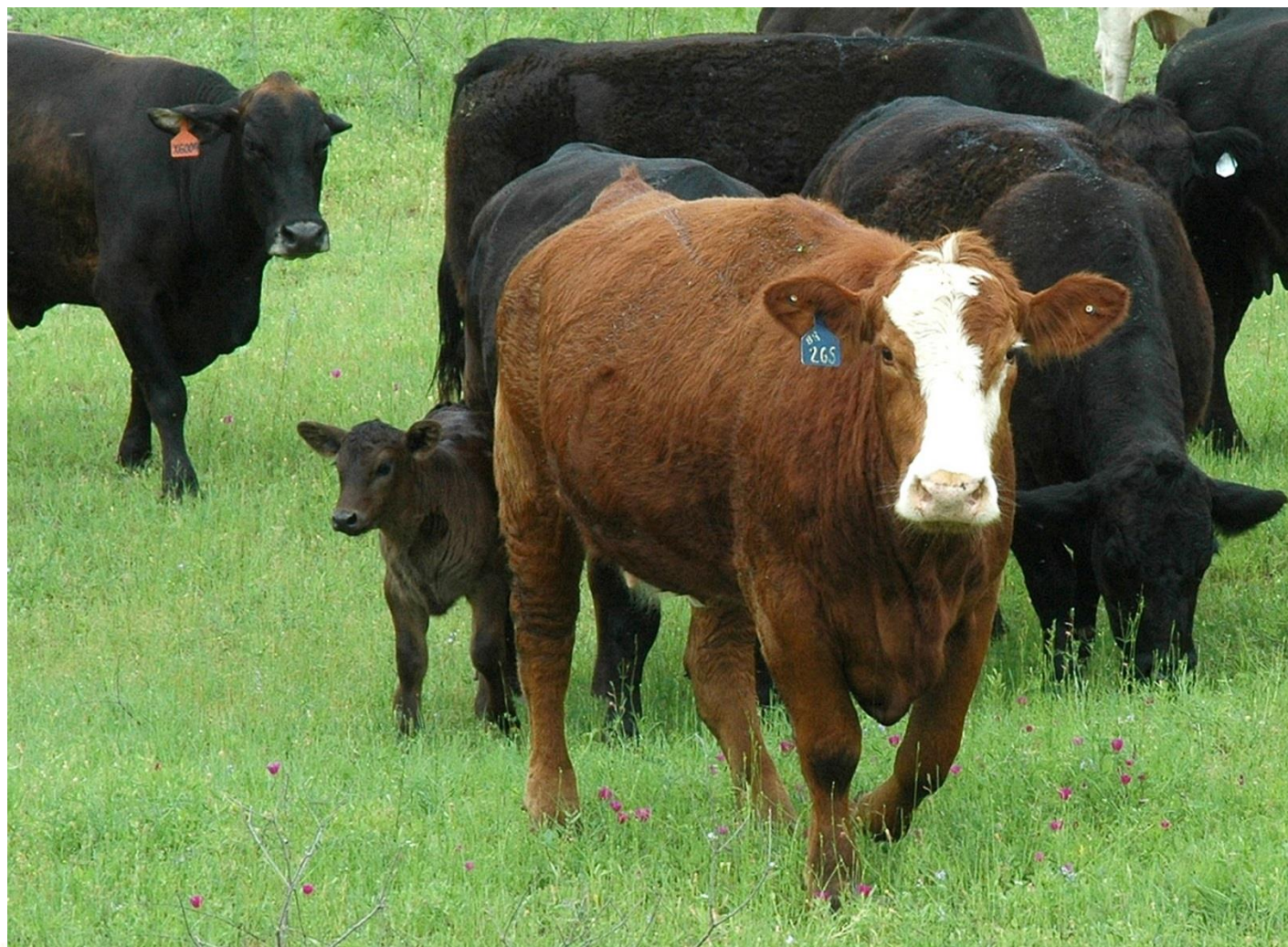
- Absorption & Avail.
  - Storage
  - Utilization
- All start immediately
  - Absorption peak 8-10 hours & finished 24
  - Storage packs away mineral not immediately used in the first day and keeps it available for 4-6 weeks
  - Enzymes last 1-2 months
  - Immediate boost provides benefit for 2-3 months



# Multimin 90

- Does not replace year-round oral trace mineral supplementation program
- Designed to supplement oral program
  - Demands during high production
  - Demands during high stress
  - Where antagonistic minerals hinder absorption (in basin and range: iron, molybdenum, sulfur)

# Multimin 90 in Cows



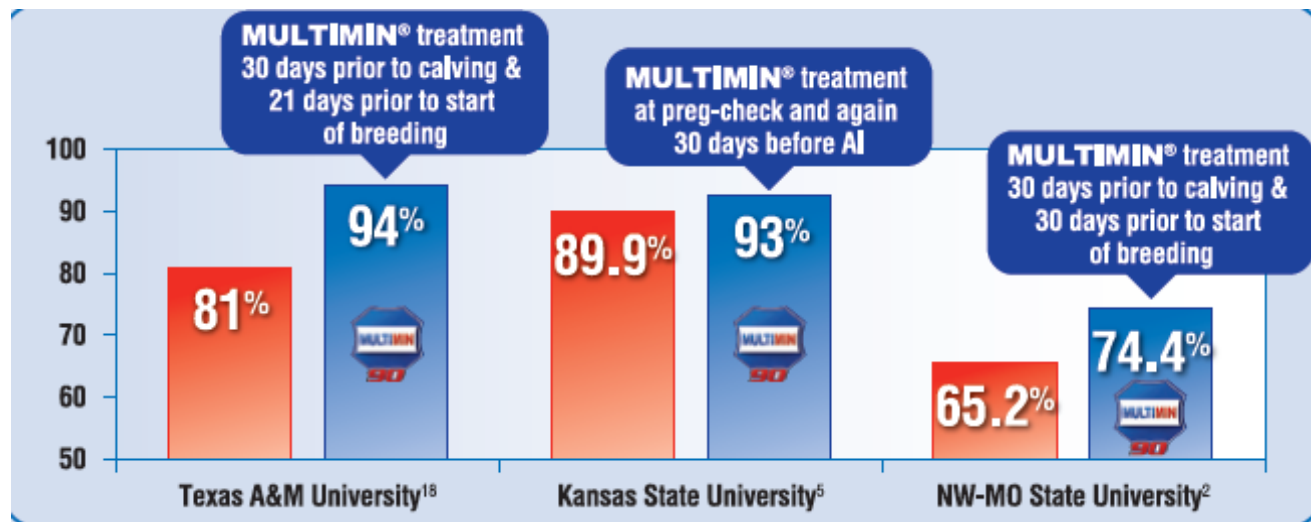
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**MULTIMIN® University Study Data**

**Overall pregnancy %**



<sup>18</sup> S.R. Daugherty, G.E. Carstens, D.B. Herd, K.S. Barling, R.D. Randel, "Effects of prenatal and prebreeding trace mineral/vitamin E injections on calf health and reproductive performance of beef cows."

<sup>5</sup> L.R. Mundell, J.R. Jaeger, J.W. Waggoner, J.S. Stevenson, D.M. Grieger, L.A. Pacheco, J.W. Bolte, N.A. Aubel, G.J. Eckerle, M.J. Macek, S.M. Ensley, L.J. Havenga, K.C. Olson, "Effects of prepartum and postpartum bolus injections of trace minerals on performance of beef cows and calves grazing native range." The Professional Animal Scientist 28 (2012):82-88

<sup>2</sup> J. Allen, "Effect of Multimin 90 on foot rot prevalence, health parameters, and growth parameters of beef cows and calves in Northwest Missouri." Study data on file

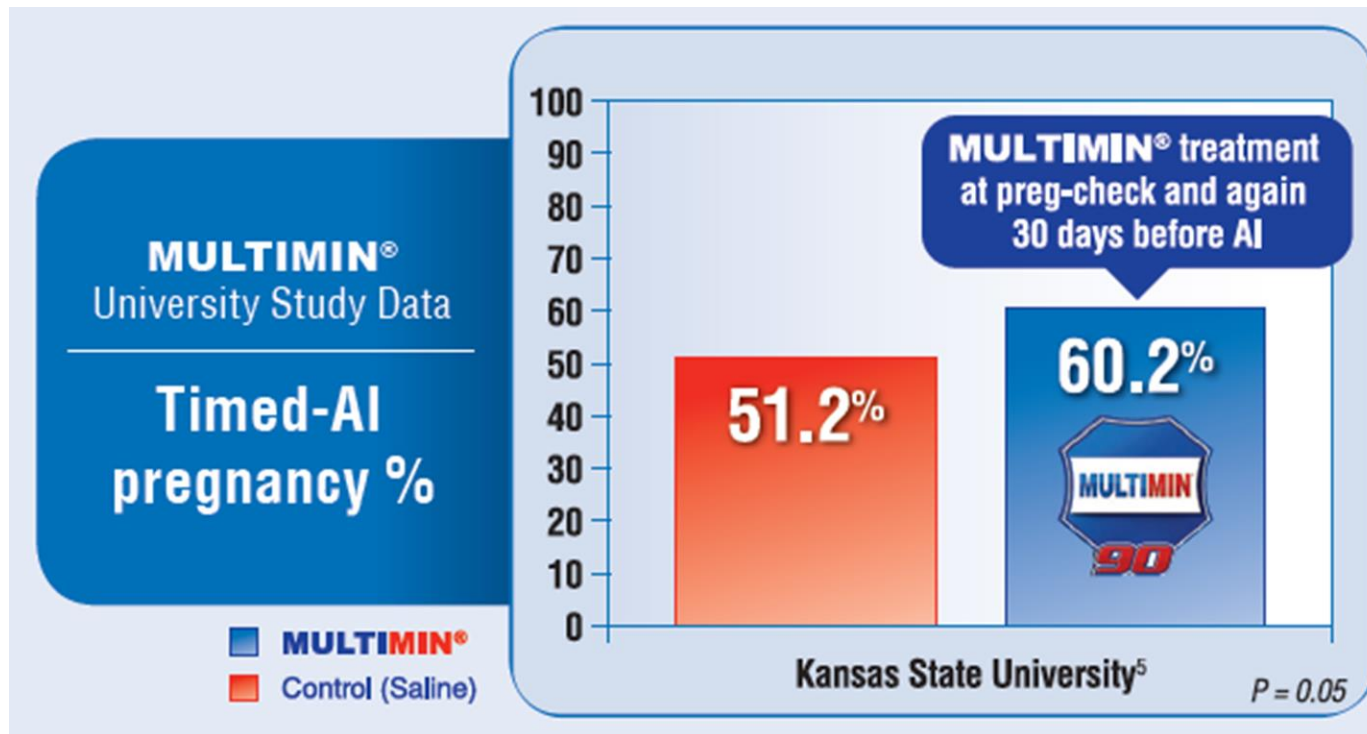
**MULTIMIN®90**

SURE Trace Mineral Supply by Timed Injection





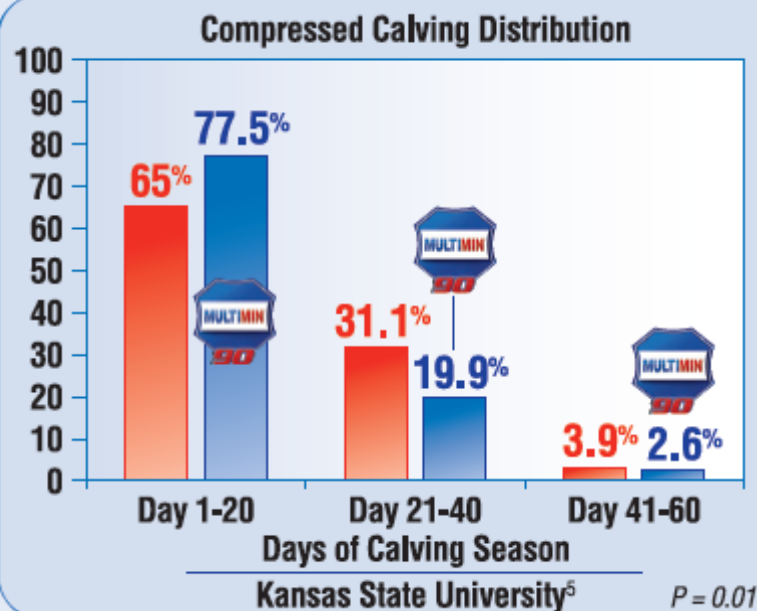
## Fixed Time AI Pregnancy Rates



**MULTIMIN®**  
University Study Data

**Female  
calving %**

 **MULTIMIN®**  
 Control (Saline)



L.R. Mundell, J.R. Jaeger, J.W. Waggoner, J.S. Stevenson, D.M. Grieger, L.A. Pacheco, J.W. Bolte, N.A. Aubel, G.J. Eckerle, M.J. Macek, S.M. Ensley, L.J. Havenga, K.C. Olson, "Effects of prepartum and postpartum bolus injections of trace minerals on performance of beef cows and calves grazing native range." The Professional Animal Scientist 28 (2012):82-88

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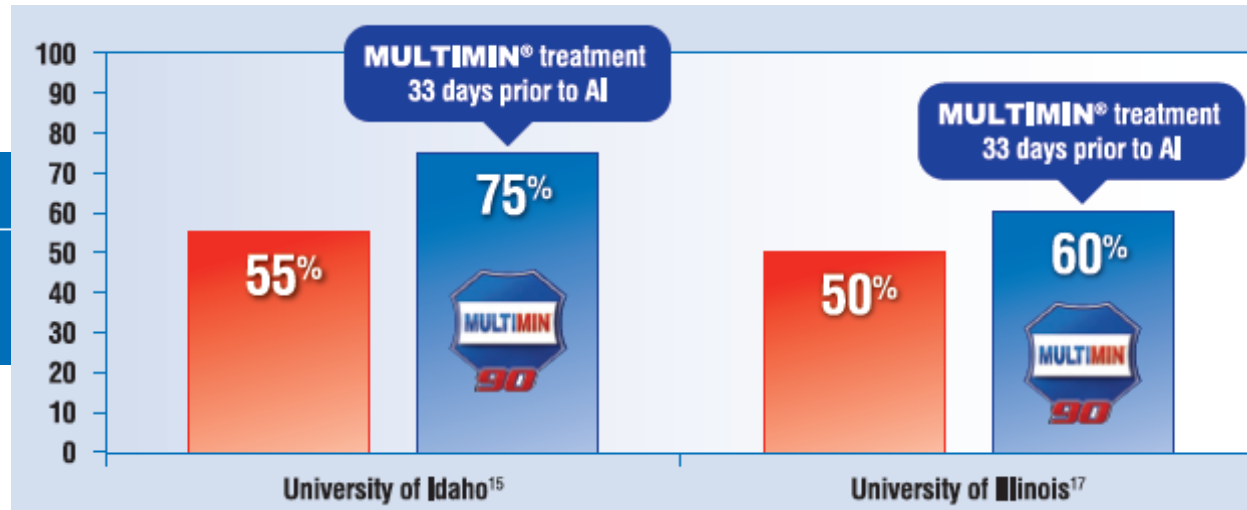
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# HEIFERS

**MULTIMIN®** University Study Data

**Pregnancy % to timed-AI  
after 14d CIDR-Protocol**



<sup>15</sup> C.J. Brasche <sup>1</sup>, J.B. Hall<sup>2</sup>, M.E. Drewnoski<sup>1</sup>, "Effect of an injectable trace mineral on pregnancy rate of virgin heifers when synchronized using the 6-d Co-Synch plus CIDR or 14-d CIDR-PG protocol." J. Anim. Sci. Vol. 92, E-Suppl. 2/J. Dairy Sci. Vol. 97, E-Suppl. 1

<sup>17</sup> University of Illinois study data on file

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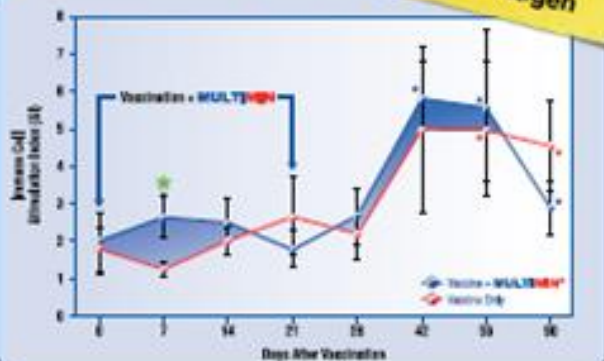




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## Bovine Respiratory Syncytial Virus (BRSV)

Modified Live Antigen



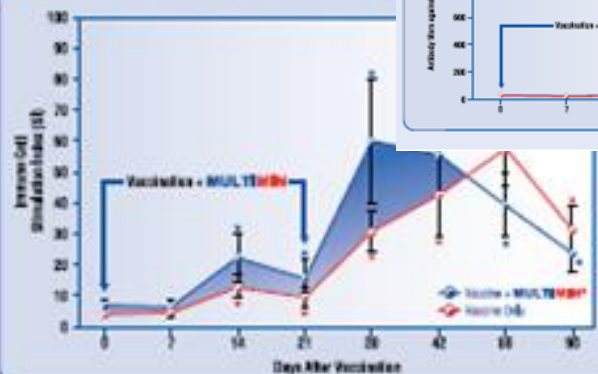
\* Difference between groups ( $P = 0.01$ )

\*\* Value differs significantly from the value on day 0 ( $P < 0.05$ )

## Streptococcus haemolytica



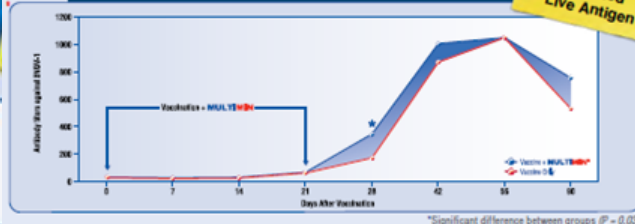
## Bovine herpesvirus-1 (BHV-1)(IBR)



\*\* Value differs significantly from the value on day 0 ( $P < 0.05$ )

## Bovine Viral Diarrhea Virus Type 1 (BVDV-1)

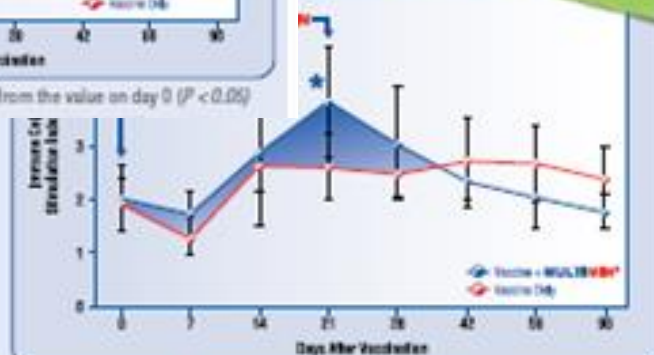
Modified Live Antigen



\* Significant difference between groups ( $P < 0.05$ )

## Colicida

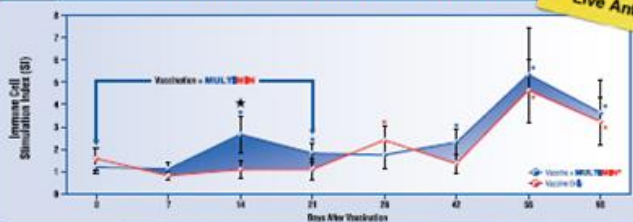
Attenuated-Live Bacterin



\* Value differs significantly from the value on day 0 ( $P = 0.02$ )

## Bovine Viral Diarrhea Virus Type 1 (BVDV-1)

Modified Live Antigen



\* Difference between groups ( $P = 0.09$ )

\*\* Values differ significantly from the value on day 0 ( $P < 0.05$ )

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SURE Trace Mineral Supply by Timed Injection



# When To Use Multimin 90

## Calves

- Birth
- Branding
- PreWeaning

# When To Use Multimin 90

## Bulls

- 60 - 90 Days PreBreeding
- At turnout



# When To Use Multimin 90

## Cows

- PreCalving
  - safe and effective for heavies
- PreBreeding
  - 30 days prior to turning bulls out

# With Injectable Multimin 90

- You supplement every animal you inject
- You provide supplementation quickly
- You by-pass any antagonists
- You target periods of high challenge and demand for your cattle



**MULTIMIN<sup>®</sup> 90** SURE Trace M







**MULTIMIN<sup>®</sup>90**

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