

# MULTIMIN<sup>®</sup>

## 90

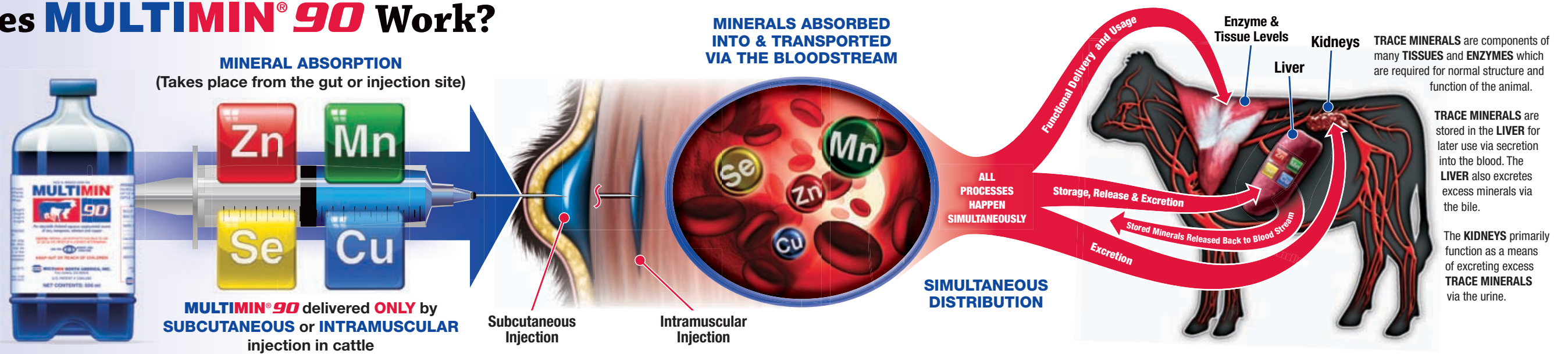


**MULTIMIN<sup>®</sup> 90:**  
*How Does It Work?*

# How Does MULTIMIN<sup>®</sup> 90 Work?

MULTIMIN<sup>®</sup> 90 provides Zinc, Manganese, Copper and Selenium in a readily available form as an injectable, which by-passes antagonists in feed, forage, distillers grain and drinking water that can reduce the absorption of these critical trace minerals.

MULTIMIN<sup>®</sup> 90 can be timed for use prior to periods of higher trace mineral demand such as calving, breeding, dry-off, shipping or introduction to the feedyard.



## 2010 Metabolism Study\*

The 2010 Metabolism Study was conducted by Dr. Stephanie Hansen, PhD. at the Iowa State Department of Animal Science.

Angus (n=10) and Simmental (n=10) calves were blocked by breed and initial bodyweight (730 ± 72 lbs) and injected with either MULTIMIN<sup>®</sup> 90 (at the recommended label dose of 1mL/100 lbs) or sterile saline.

Calves received a corn-silage based diet and manganese, copper, zinc and selenium were supplemented at NRC recommended levels.

Blood was collected immediately prior to injection and at 8 and 10 hours post injection and on day 1 (24h post injection), 8 and 15 days post injection.

Liver biopsies for mineral analysis were collected 3 days prior to injection and on day 1, 8 and 15 days post injection.

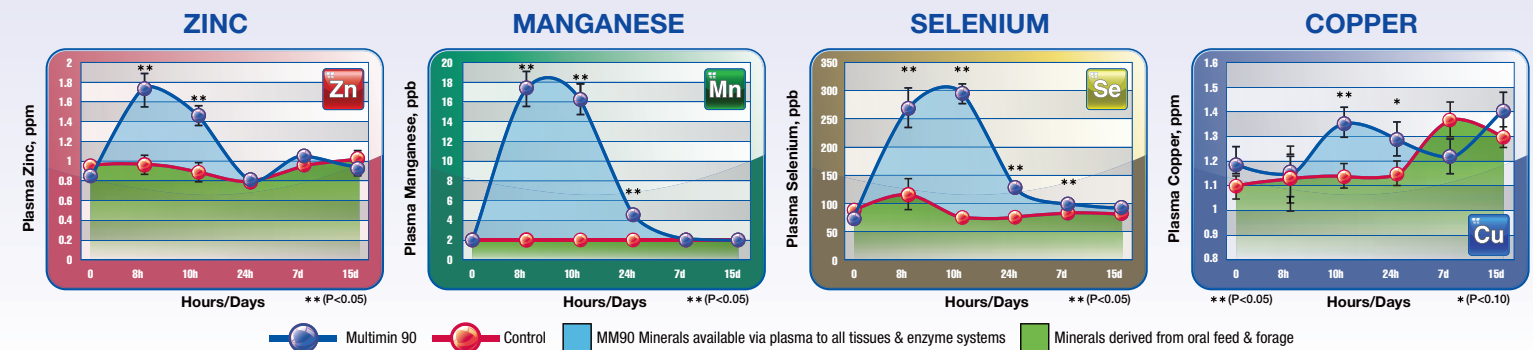
When considering trace mineral supplementation, there are **THREE CRITICAL QUESTIONS** to consider:

### QUESTION 1:

DOES the supplement actually cause an **INCREASE** in blood/serum/plasma levels, to actually have **MORE** mineral available to tissue and enzyme systems?

#### RESULTS: Blood Plasma

The set of graphs to the right helps us answer our first question. The data shows that MULTIMIN<sup>®</sup> 90 provides additional mineral from as early as 8 hours post injection, for a period of at least 24 hours.

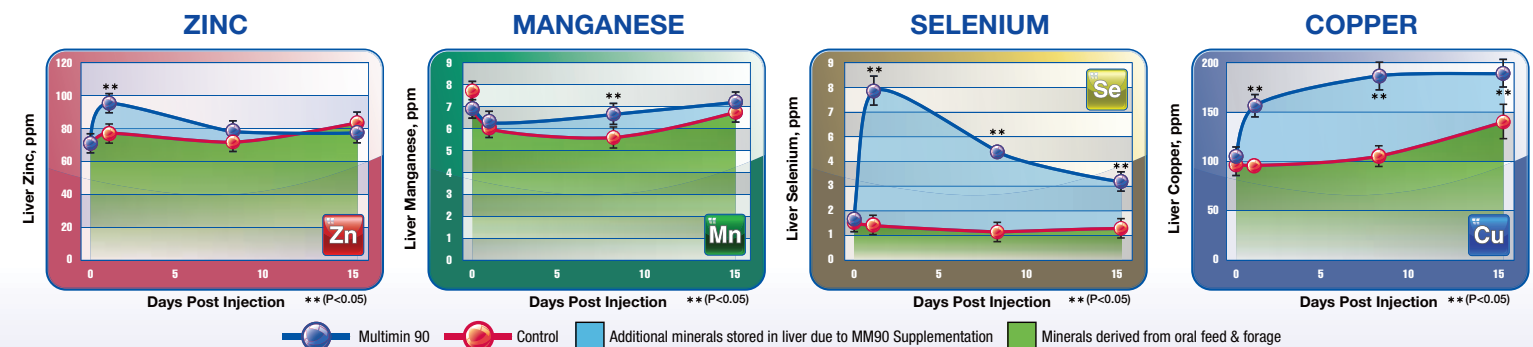


### QUESTION 2:

DOES the supplement also leave some residual mineral in a storage organ like the liver for **FUTURE** use?

#### RESULTS: Liver Biopsy - Mineral Analysis

The set of graphs to right helps us answer our second question. The data shows that MULTIMIN<sup>®</sup> 90 provides additional mineral for storage in the liver from 24 hours (day 1) after injection.

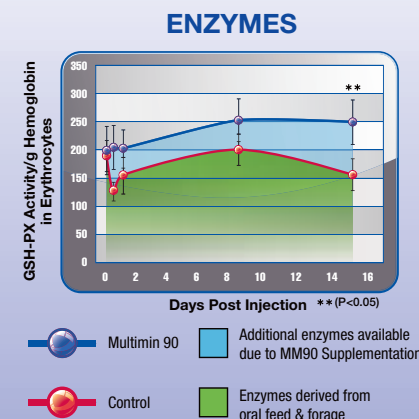


### QUESTION 3:

DOES the supplement actually improve enzyme levels in the animal, as very often, the enzyme does the work and the mineral merely forms part of it, so does the mineral result in the correct action?

#### RESULTS: Enzyme Response

The graph to the right helps us answer our third question. The data shows that MULTIMIN<sup>®</sup> 90 provides additional enzyme over control animals which is significant as early as 15 days post injection.



### CONCLUSION:

- MULTIMIN<sup>®</sup> 90 rapidly increases trace mineral status of animals when compared to non-treated animals.
- MULTIMIN<sup>®</sup> 90 rapidly increases liver storage of trace minerals following injection compared to non-treated animals.
- MULTIMIN<sup>®</sup> 90 significantly increases Glutathione Peroxidase as early as 15 days post injection, contributing to the anti-oxidant system of the animal.

**NOTE:** All animals in this study were **not deficient** in any of the minerals at the onset of the study.

For more information see our website at [www.multimininglobal.com](http://www.multimininglobal.com)

\* Study conducted by Iowa State University



