



MINTREX<sup>®</sup>

for



# QUALITY TRACE MINERAL SOLUTIONS

NOVUS<sup>®</sup>  
SOLUTIONS SERVICE SUSTAINABILITY™



## ►► HIGH-PERFORMANCE ANIMALS REQUIRE QUALITY MINERALS

Whether you are a poultry, pork, beef, dairy or aqua producer, a nutritionist responsible for developing dietary programs or a feedmill operator, you know quality counts for optimizing animal performance.

Novus delivers consistent, high-quality trace minerals for the livestock and pet industries. Because of a stringent quality control program, every lot that is produced complies with high-quality standards.

### **Global Standards Based on Quality**

MINTREX® products are manufactured in the United States using the Novus Quality Management System. To ensure secure and high-quality trace mineral solutions, products are consistently analyzed to assure compliance with stringent global standards. From qualification of suppliers to the procurement of raw materials for production, this system creates optimal production conditions with systematic monitoring and controls to deliver a highly effective product free from potentially harmful contaminants or impurities.

### **Sourcing Only the Best Ingredients**

The supplier qualification process begins with a strict examination of raw materials for undesirable contaminants. Any lots containing dangerous substances (heavy metals, dioxin or PCBs) are immediately rejected. Novus requires suppliers to code raw material lots individually for full traceability, meaning we can trace each lot of our product back to each lot of raw material and each supplier. Should a problem arise, Novus can locate the source of the issue. Each lot of raw material must be delivered with a Certificate of Analysis to ensure quality.

### **Quality Trace Mineral Solutions by Chelation**

MINTREX provides the most bio-available trace mineral solution to producers. How? Chelating one molecule of metal with two molecules of HMTBa (2 hydroxy-4-methylthiobutanoic acid) creates a strong bond, minimizing mineral loss in the gastro-intestinal (GI) tract. As a result, MINTREX delivers a greater amount of absorbable trace mineral to the small intestine. The structure and degree of chelation in MINTREX is independently verified via the following state-of-the-art chemical analyses:

1. FT-IR spectroscopy assay confirms chelation of the minerals
2. X-Ray crystallography demonstrates the ratio of HMTBa to metal
3. Measurements of total and bound HMTBa verifies percent of metal complexation

### **MINTREX: UNIQUE CATEGORIES WITHIN THE EUROPEAN UNION AND THE UNITED STATES**

Thanks to the unique ligand, HMTBa, MINTREX chelated trace minerals are categorized within the EU in a unique, separate group of trace minerals defined by the European Commission as 'chelates of metals and HMTBa' (EU regulation EC No 350/2010, No 335/2010, No 349/2010).

Recently the AAFCO (American Association of Feed Control Officials) accepted also a new feed ingredient definition for MINTREX recognizing it to belong to a 'new category of chelated minerals'.

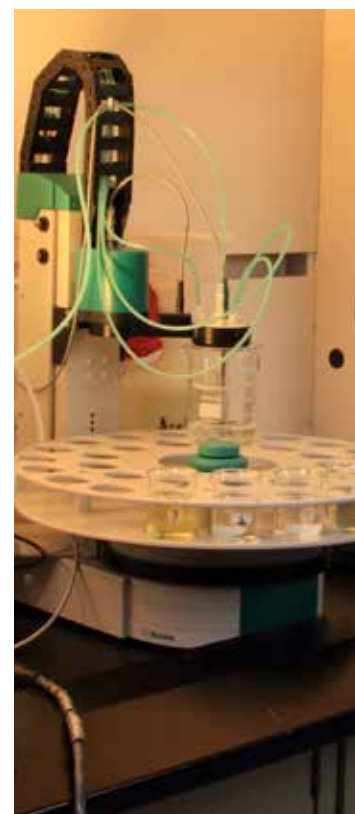
## *Rigorous quality parameters for assuring customer satisfaction*

### **Manufacturing Processes to Exacting Standards**

The same quality commitment used to procure the best raw materials extends through the entire MINTREX production process. Strictly controlled processes and automated systems assure consistent times and temperatures for each batch manufactured. These systems are developed by qualified Novus chemists and audited by Novus Quality Assurance personnel to maintain a safe manufacturing environment operated to the highest quality standards.

MINTREX products are made on dedicated equipment in a closed system to prevent contamination from outside sources. The type and amount of ingredients used in each manufacturing batch are carefully measured and recorded, along with the lot numbers of raw materials. Highly trained Novus manufacturing managers review each batch record to assure compliance with prescribed procedures and control limits.

Finished MINTREX products are tested to guarantee compliance with rigorous specifications for purity and performance. These product specifications include precise requirements on metal content (i.e., zinc, copper, manganese, etc.), and HMTBa content. In addition, heavy metals, dioxins and dioxin-like PCB levels are analyzed and printed on the Certification of Analysis to assure purity and performance. The physical characteristics of finished product are tested using industry standards as well as Novus proprietary methods. Dustiness, flowability, particle size and caking tendency are analyzed and must meet specifications dictated by manufacturing specifications in the Novus Quality Management System.



### *Packaging*

All MINTREX chelated trace mineral packaging facilities are certified with the Code of Practice for Feed Additive and Pre-mixture Quality Systems (FAMI-QS).

Novus requires its manufacturers and packagers to have obtained one or more of the following certifications:

- FAMI-QS
- AFIA Safe Food/Safe Feed
- ISO 9001
- RC 14000
- ISO 22000
- ISO 14000
- HACCP

Novus emphasizes the importance of traceability by submitting all manufacturing facilities to complete a “traceability drill” at least once a year. Facilities are notified of a specific lot of either finished product or raw material and must produce full traceability documentation for all products and/or ingredients in the specified lot within four hours. In these drills, Novus consistently succeeds in providing full traceability, from raw materials to finished product destination.



## Quality Control from Beginning to End



### Supplier Management

- Stringent selection criteria
- Qualified and approved
- Minor impurities control plan
- Independent verification



### Material Procurement

- Certificate of Analysis
- Compliant with stringent industrial standards
- Heavy metal, dioxin and PCBs tests on each batch



### Traceability System

- Each lot of raw material is coded
- Finished goods have a unique lot number
- Batch records are documented
- Traceability drills conducted at each facility at least once a year



### Shipment Quality Control

- Each lot of finished product is tested before shipment
- Chemical testing covers metal content and HMTBa content
- Physical testing covers moisture, particle sizes, dustiness, flowability and caking tendency



### Production Process

- Facilities free of chemical and microbial impurities
- Qualified and audited by Novus experts
- Dedicated production lines for specific products
- Closed systems to prevent adulteration
- Products are analyzed to meet manufacturing and sales specifications

## About Novus

Novus is a leading developer of animal health and nutrition solutions for the poultry, pork, beef, dairy, aquaculture and companion animal industries. Our staff includes more than 50 Ph.D. animal nutritionists, doctors of veterinary medicine, biologists and chemists committed to delivering innovation that helps our customers improve performance. From more than 25 locations around the world, on behalf of clients in more than 90 countries, we dedicate ourselves to this mission every day.

For more information, contact your Novus sales representative directly

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