

70th

Minnesota Nutrition Conference

University of Minnesota Research Update, *and*

Pre-conference Symposium: Fostering Optimum GI Development,
Integrity and Function in Livestock and Poultry



Proceedings

September 15-16, 2009

Owatonna, Minnesota

2009 Conference Supporters - Thank You!

On behalf of the Minnesota Nutrition Conference Planning Committee and the conference participants, we proudly acknowledge and thank our sponsors for their generous contributions to this educational meeting.

Symposium Sponsor

BFI Innovations, Inc./Nutri-Ad

Luncheon Sponsors

BFI Innovations, Inc./Nutri-Ad

Diamond V Mills, Inc.

Speaker Sponsors

Elanco Animal Health

Evonik Industries

Sparboe Farms, Inc.

Platinum Sponsors

Minnesota Corn Growers Association

Minnesota Soybean Research & Promotion Council

Gold Sponsors

Adisseo USA, Inc.

JBS United, Inc.

Cargill Animal Nutrition, Inc.

Kindstrom-Schmoll, Inc.

Cerne Sales Company

Land O'Lakes Purina Feed LLC

Danisco Animal Nutrition

Northwest Feed Manufacturers Association

DSM Nutritional Products, Inc.

Prince Agri Products, Inc.

Faegre & Benson LLP

Quali Tech, Inc.

Feed Products North, Inc.

Ralco Nutrition, Inc.

Hormel Foods Corporation - Feed Division

Trouw Nutrition International

Hubbard Feeds, Inc.

Vi-COR

ILC Resources

Zinpro Corporation

Silver Sponsors

ADM Alliance Nutrition

International Ingredient Corporation

Akey

MIN-AD, Inc.

Alltech, Inc.

Stearns DHIA Laboratories

Alpharma Animal Health

Vita Plus Corporation

CD Sponsor

Land O'Lakes Purina Feed LLC

Event Sponsor

Department of Animal Science, University of Minnesota

70th Minnesota Nutrition Conference

The Minnesota Nutrition Conference provides a forum for feed industry professionals to update their knowledge of beef, dairy, poultry, and swine nutrition. Internationally renowned researchers bring the latest concepts in livestock nutrition to the upper Midwest.

The Minnesota Nutrition Conference is presented by the Department of Animal Science, University of Minnesota and University of Minnesota Extension.

www.ansci.umn.edu/mnc.html



College of Food, Agricultural
and Natural Resource Sciences

UNIVERSITY OF MINNESOTA

UNIVERSITY OF MINNESOTA

EXTENSION

Conference Planning Committee

Conference Co-chairs:

John Goihl, Agri-Nutrition Services, Inc.

Lee Johnston, West Central Research and Outreach Center, University of Minnesota-Morris

Gary Asche, Form-A-Feed, Inc.

Ed Beaver, Land O'Lakes Purina Feed LLC

Bruce Behrends, Agri-Tech, Sparboe Companies

Wayne Brommelsiek, Quali Tech, Inc.

Mike Brumm, Brumm Consulting

Hugh Chester-Jones, Southern Research and Outreach Center, University of Minnesota-Waseca

Alfredo DiCostanzo, Department of Animal Science, University of Minnesota-St. Paul

Larry Dunn, Hormel Foods Corporation

Milan Hruby, Danisco Animal Nutrition

LeAnn Johnston, Hubbard Feeds, Inc.

Jeff Knott, Ralco Nutrition, Inc.

Korin Leske, Michael Foods Egg Products Company

James Linn, Department of Animal Science, University of Minnesota-St. Paul

Joe Loughmiller, Akey

Ron Moser, JBS United

Dick Nelson, Willmar Poultry

Sally Noll, Department of Animal Science, University of Minnesota-St. Paul

Vern Oraskovich, Waconia Farm Supply

Doug Pamp, Biovance Technologies

Michael Schmoll, Kindstrom-Schmoll, Inc.

Guillermo Schroeder, Cargill Animal Nutrition, Inc.

Mike Socha, Zinpro Corporation

Barry Visser, Vita Plus Corporation

DISCLAIMER: References to commercial products or services are intended for informational and educational purposes only, and do not necessarily reflect the views or opinions of the Department of Animal Science, University of Minnesota Extension, or the University of Minnesota as a whole.

Table of Contents

	Page
Conference Speakers	1
Conference Sponsors	3
Pre-conference Symposium: Fostering Optimum GI Development, Integrity and Function in Livestock and Poultry	
Essential oils as rumen modifiers in dairy cows: Opportunities and challenges	21
- Chaouki Benchaar, Agriculture and Agri-Food Canada	
Modulation of immune function in food producing animals designed to optimize gut health, general well-being and production performance- With special emphasis on yeast cell wall components	44
- Jan Van Eys, Nutri-Ad	
Epigenetic adaptations in poultry: A case for in ovo feeding strategies	60
- Peter Ferket, North Carolina State University	
Organic acid utilization in early phases of pig production, with special emphasis on butyric acid: Enzymatic efficiency, antimicrobial potential and gastro intestinal development	77
- José Antonio Cuarón, INIFAP	
University of Minnesota Livestock Research Update	
Crude glycerin in market turkey diets	88
- Sally Noll, Department of Animal Science	
Growth performance, carcass characteristics, physiological and gut health effects of feeding diets containing BMD to heat stressed finishing pigs	89
- Jerry Shurson, Department of Animal Science	
Reducing negative effects of sulfur in beef cattle diets	90
- Grant Crawford, University of Minnesota Extension	
Trace mineral nutrition of dry dairy cows and progeny growth	91
- Greg Golombeski, Department of Animal Science	
Low oligosaccharide soybean meal in diets of early weaned pigs	92
- Samuel Kofi Baidoo, Southern Research and Outreach Center	
Managing hay and supplement intake in wintering beef cows	93
- Alfredo DiCostanzo, Department of Animal Science	
Biofilters for odor control	94
- Kevin Janni, Department of Bioproducts and Biosystems Engineering	
In vitro and in vivo effects of soluble crude protein, <i>Yucca schidigera</i> extract and <i>Saccharomyces cerevisiae</i> on rumen metabolism	95
- Martin Ruiz-Moreno, Department of Animal Science	
Animal Welfare for Nutritionists	
Distinguishing between animal abuse and bad management	96
- Edmond Pajor, University of Calgary (<i>paper not available at press time</i>)	
Expectations of an animal welfare audit	97
- Earl Dotson, Validus Services LLC	

Table of Contents – continued

	Page
Ruminant Session	
Poisonous plants in livestock feeding	106
- Krishona Martinson, University of Minnesota	
Nutrition and management of feedlot heifers	115
- Jolene Kelzer, University of Minnesota	
Effects of source and particle size of fiber on feedlot performance and carcass characteristics	134
- Nicolas DiLorenzo, Texas Tech University	
Implications of cow size on formulating beef cow rations	147
- Ryon Walker, University of Minnesota Extension	
Nutritional factors affecting mammary gland development of growing dairy heifers	158
- Michael VandeHaar, Michigan State University	
Milk fat depression: Interactions of ionophores, fat supplements, and other risk factors	172
- Thomas Jenkins, Clemson University	
Achieving better reproduction: Does nutrition impact reproduction programs?	185
- Ricardo Chebel, University of Minnesota	
New on-farm technologies for dairy consultants	205
- Jeff Reneau, University of Minnesota	
Non-ruminant Session	
Dietary interventions to enhance human health aspects of pork	210
- Ryan Cox, University of Minnesota	
National swine nutrition guide	220
- Mark Whitney, University of Minnesota Extension	
New amino acid concentrations for industry grow-finish swine diets	223
- Mark Bertram, First Choice Livestock, LLC	
Feeding market boars for pork production	234
- José Antonio Cuarón, INIFAP	
Proper conduct and interpretation of field trials	248
- Kenneth Krueger, Diamond K Research and Consulting Service	
Digestible amino acid formulations for poultry	255
- Todd Applegate, Purdue University	
Feed formulations to control risk	266
- Bill Roush, USDA-ARS (retired)	
Proceedings Order Form	273
Table of Contents from Past Proceedings (2003-2008)	274

2009 Conference Speakers

Dr. Todd Applegate

Associate Professor and Extension Poultry Specialist
Department of Animal Sciences
Purdue University
West Lafayette, IN

Dr. Samuel Kofi Baidoo

Associate Professor, Swine Nutrition and Management
Southern Research and Outreach Center
University of Minnesota
Waseca, MN

Mr. Lynn Becker

Swine Production Manager
LB Pork
Fairmont, MN

Dr. Chaouki Benchaar

Research Scientist
Agriculture and Agri-Food Canada
Sherbrooke, Quebec, Canada

Dr. Mark J. Bertram

Swine Nutritionist
First Choice Livestock, LLC
Polk City, IA

Dr. Ricardo Chebel

Assistant Professor
Department of Veterinary Population Medicine
University of Minnesota
St. Paul, MN

Dr. Ryan Cox

Assistant Professor, Meat Science
Department of Animal Science
University of Minnesota
St. Paul, MN

Dr. Grant Crawford

Assistant Extension Professor, Beef Cattle
University of Minnesota Extension
Regional Extension Center
Hutchinson, MN

Dr. José Antonio Cuarón

Senior Scientist
INIFAP
Querétaro, Mexico

Dr. Alfredo DiCostanzo

Professor, Beef Cattle Nutrition and Management
Department of Animal Science
University of Minnesota
St. Paul, MN

Dr. Nicolas DiLorenzo

Post-Doctoral Research Associate
Department of Animal and Food Sciences
Texas Tech University
Lubbock, TX

Mr. Earl Dotson

President and CEO
Validus Services LLC
Urbandale, IA

Dr. Peter Ferket

Professor
Department of Poultry Science
North Carolina State University
Raleigh, NC

Mr. Greg Golombeski

PhD Research Assistant
Department of Animal Science
University of Minnesota
St. Paul, MN

Dr. Kevin Janni

Professor and Extension Engineer
Department of Bioproducts and Biosystems Engineering
University of Minnesota
St. Paul, MN

Dr. Thomas Jenkins

Professor
Department of Animal and Veterinary Sciences
Clemson University
Clemson, SC

Ms. Jolene Kelzer

PhD Research Assistant
Department of Animal Science
University of Minnesota
St. Paul, MN

Mr. Keith Klanderma

President and CEO
BFI Innovations, Inc.
Elgin, IL

2009 Conference Speakers – continued

Dr. Kenneth Krueger

Owner
Diamond K Research and Consulting Service
Marshville, NC

Dr. Krishona Martinson

Assistant Professor and Equine Extension
Specialist
Department of Animal Science
University of Minnesota
St. Paul, MN

Dr. Sally Noll

Professor, Poultry (Turkeys)
Department of Animal Science
University of Minnesota
St. Paul, MN

Dr. Edmond Pajor

Professor of Animal Welfare
Department of Production Animal Health
Faculty of Veterinary Medicine
University of Calgary
Calgary, Alberta, Canada

Dr. Jeff Reneau

Professor, Dairy Cattle Management
Department of Animal Science
University of Minnesota
St. Paul, MN

Dr. Bill Roush

Animal Scientist, Poultry Research (retired)
USDA-ARS, Mississippi State University
Mississippi State, MS

Mr. Martin Ruiz-Moreno

PhD Research Assistant
Department of Animal Science
University of Minnesota
St. Paul, MN

Dr. Jerry Shurson

Professor, Swine Nutrition and Management
Department of Animal Science
University of Minnesota
St. Paul, MN

Dr. Michael J. VandeHaar

Associate Professor
Department of Animal Science
Michigan State University
East Lansing, MI

Dr. Jan Van Eys

Global Dairy Products Manager
Nutri-Ad
Paris, France

Dr. Ryon Walker

Associate Extension Professor, Beef Cattle
University of Minnesota Extension
Regional Extension Center
Andover, MN

Dr. Mark Whitney

Associate Extension Professor, and Swine
Program Leader
University of Minnesota Extension
Regional Extension Center
Mankato, MN

Symposium Sponsor



BFI Innovations, Inc. / Nutri-Ad

420 C Airport Road
Elgin, IL 60123

847-214-4860

www.appliednature.com/

Luncheon Sponsors



BFI Innovations, Inc. / Nutri-Ad

420 C Airport Road
Elgin, IL 60123

www.appliednature.com/

847-214-4860



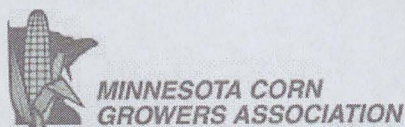
Diamond V Mills, Inc.

838 1st Street NW
PO Box 74570
Cedar Rapids, IA 52407-4570

www.diamondv.com/

Todd Franz
507-920-8601
tfranz@diamondv.com

Platinum Sponsors

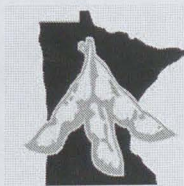


**Minnesota Corn Growers
Association**

738 First Avenue East
Shakopee, MN 55379

www.mncorn.org

Riley Maanum
952-233-0333
maanum@mncorn.org



**Minnesota Soybean Research
& Promotion Council**

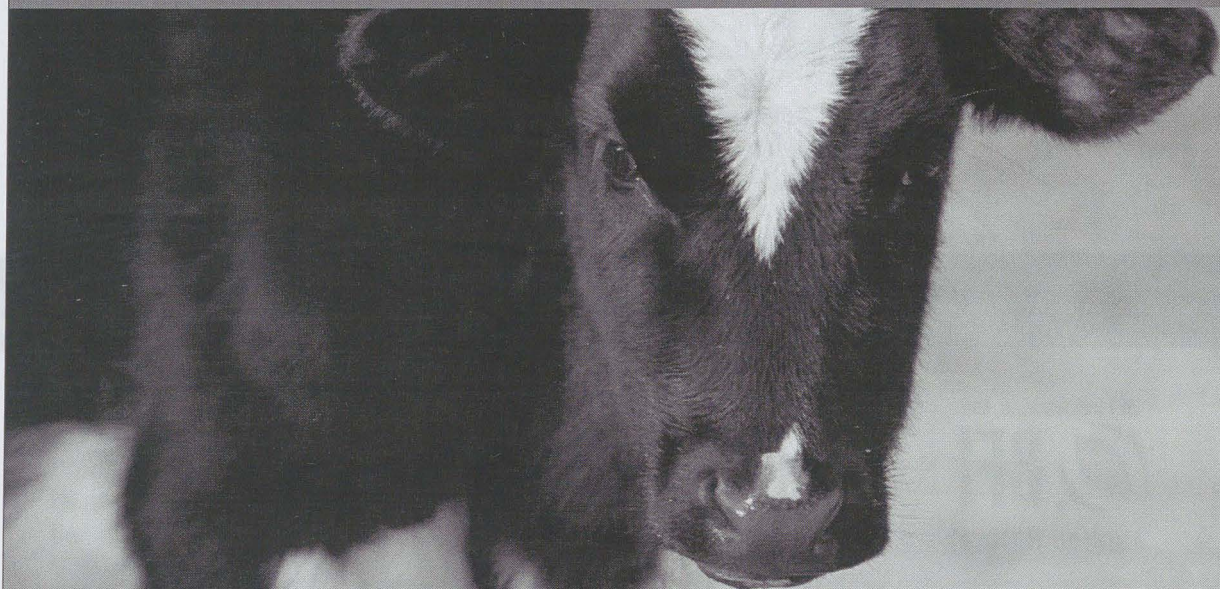
151 Saint Andrews Court
Suite 710
Mankato, MN 56001

www.mnsoybean.org/MSRPC

Mike Youngerberg
507-388-1635
mike@mnsoybean.com

palatability + enhanceability + sustainability

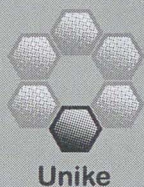
= PROFITABILITY



Feed Flavors provide consistent taste profiles. As animal nutritionists strive for diets that benefit nutritionally they are often faced with masking unpleasant aromas and tastes. Adding a uniform flavor profile helps overcome feed refusal issues.



Apex is an innovative range of natural ingredients that incorporate known benefits of specific plant extracts to optimize animal performance naturally.



Unike has been shown to improve animal performance by maintaining production efficiency, decreasing feed refusal and immune suppression, and minimizing stresses related to production, reproduction, and environmental issues.



www.appliednature.com
420 C Airport Rd, Elgin IL
800.841.3320

BFI Innovations, Inc.

NUTRITION FIRST

FOR EVERYONE IN YOUR BARNYARD



 **Diamond V**[®] *YC*[™] *XP*[™] *XPC*[™]
THE ORIGINAL

There's not an animal you work with that we can't help. Beef cattle, horses, poultry, hogs, aquaculture, dairy cows, and more benefit from Diamond V Yeast Culture[™] nutritional products.

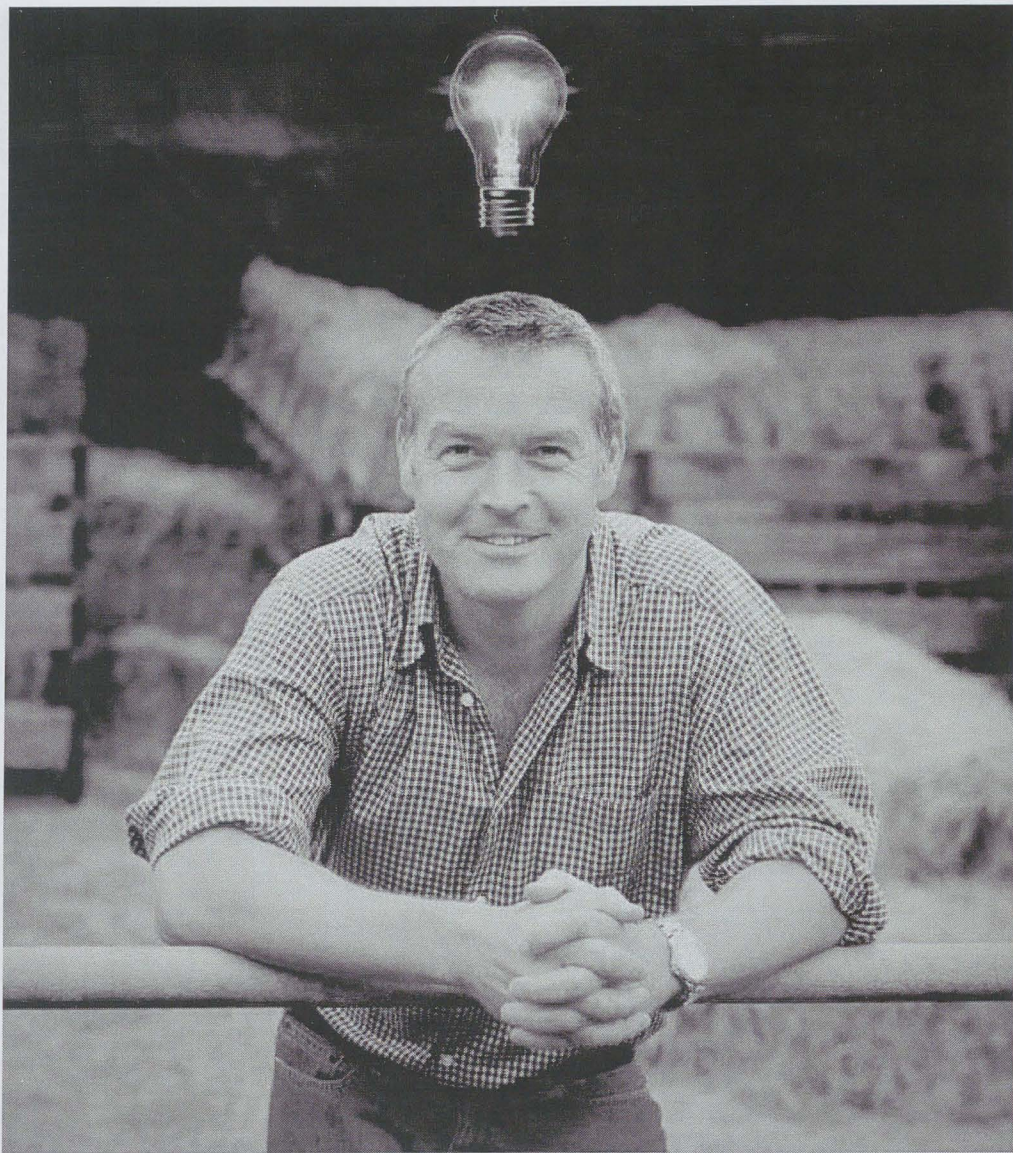
Our Original YC[™], XP[™], and XPC[™] are recognized around the world for optimizing digestion and maximizing animal performance.

With over 65 years of research demonstrating its efficacy, nutritionists and veterinarians trust it to perform. Producers around the world have seen the results. Trust Diamond V to help your clients' animals.

 **Diamond V**[®]
RESEARCH TESTED. PERFORMANCE PROVEN.[™]

For more information call 800-373-7234 or visit www.diamondv.com

©2009 Diamond V Mills, Inc. All rights reserved. Diamond V[®] is a registered trademark and YC[™], XP[™], XPC[™] and DiaMatrix Technology[™] are trademarks of Diamond V Mills, Inc.

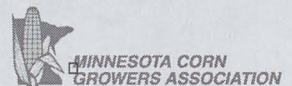


Today's Farmers Aren't Farming More, They're Farming Smarter.

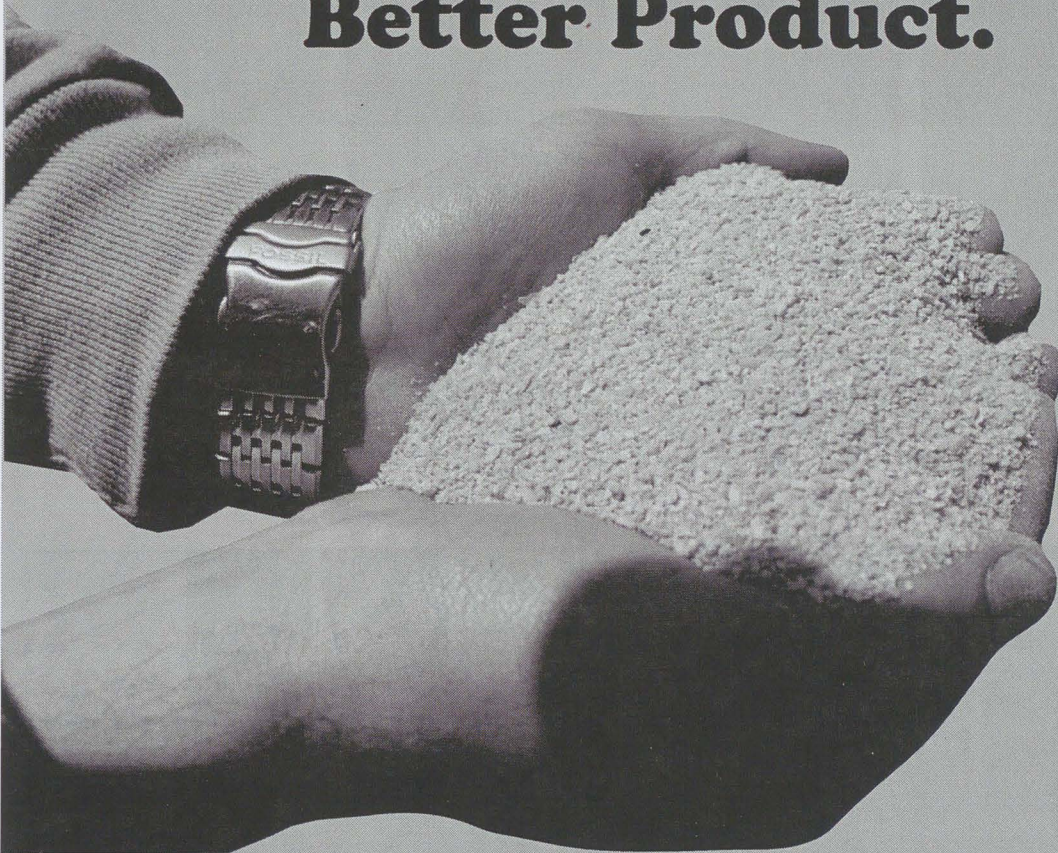
Today's corn farmers are using best management practices to help conserve soil, protect wildlife and improve air quality—all while providing an abundant supply of corn to meet world demand for food and feed. The fact is, since 1944, corn farmers across the country are harvesting nearly four times more corn today on about the same amount of land—all with using a lot less fertilizer and pesticides per bushel.

And Minnesota corn farmers are especially proud to be part of the solution to help America be less dependent on foreign oil by providing a steady flow of homegrown, renewable ethanol. How smart is that? See for yourself at www.mncorn.org.

 **Fresh Thinking**
MINNESOTA'S CORN FARMERS



Better Beans.
Better Nutrition.
Better Product.




By investing checkoff dollars in research programs to grow better beans & improve the quality of soybean meal, soybean farmers are helping livestock producers become more efficient and raise a healthier herd.



Minnesota Soybean Research & Promotion Council


Speaker Sponsors

Efficiency.



The label contains complete instructions, including lot numbers, directions, and other information. Please read the label carefully. Use only the amount of product specified on the label. © 2018 Elanco Animal Health.

Cash flow.




© 2018 Elanco Animal Health.

Positively.



The label contains complete instructions, including lot numbers and directions. Always wash your hands and clean the feed and equipment. Contact your veterinarian for more information. © 2018 Elanco Animal Health. (284)1012.




Turning knowledge into your profitability

Evonik provides you with all four essential amino acids for animal nutrition: DL-Methionine, Biolys®, L-Threonine, L-Tryptophan. But just as importantly, our range of AMINOTOOLS provides you with everything you need to maximize efficiency.

feed-additives@evonik.com | www.evonik.com/feed-additives

AMINODat® AMINONEC™ AMINOQ®
AMINOLab® AMINONIR® AMINOSys®

Evonik. Power to create.



Speaker Sponsors – continued



Sparboe Farms Inc., headquartered in Litchfield, MN is the nation's 4th largest egg producer. Sparboe Farms is family owned and has been in business for 55 years. Its sister company, Sparboe Foods Inc., is a major producer of liquid and dried egg products. The company provides shell eggs to major grocery chains throughout the country and processed egg products to major food manufacturers.

The **AGRI-TECH** division provides nutrition consulting and premixes to the egg production industry in the U.S. and several foreign countries.

Dr. Bruce R. Behrends
Sparboe Farms Inc., AGRI-TECH
PO Box 309
Litchfield, MN 55455
bruce.behrends@sparboe.com
WWW.SPARBOE.COM

Gold Sponsors

Are You Among the 80%?

8 out of 10 dairy nutritionists balance rations for amino acids, according to a 2008 research study*

You may dispute the number, but plenty of research highlights the benefits of balancing amino acids with MetaSmart® protected methionine.

These benefits include:

- ▲ Higher milk components for higher milk checks
- ▲ Reduced crude protein needs
- ▲ Increased IOFC

* Research study available upon request.

Amino Acid Balancing - Do it Right!



MetaSmart®
Methionine for Ruminants

Adisseo.com | SalesInfoNA@Adisseo.com

ADISSEO
A Bluestar Company

Adding Difference

Cargill™

www.cargillanimalnutrition.com

Cargill Animal Nutrition

Mike Jerred

12900 Whitewater Drive, MS14

Minnetonka, MN 55343

952-984-1852 (office)

612-669-4857 (cell)

mike_jerred@cargill.com

A business unit of Cargill, Incorporated, **Cargill Animal Nutrition** is a customer-focused organization working to bring products, processes and solutions to producers. Cargill is an international provider of food, agricultural and risk management products and services. With 158,000 employees in 66 countries, the company is committed to using its knowledge and experience to collaborate with customers to help them succeed.

Gold Sponsors – continued



CERNE SALES COMPANY

One Corporate Place
1501 42nd Street, Suite 390
West Des Moines, IA 50266
www.cernesales.com

Joe Cerne Jr.
515.223.8844
1.800.397.3333
jcerne@cernesales.com

- Cerne Calcium Company – High Quality Calcium Carbonate
- Mosaic Feed Ingredients – Feed Phosphates, Potassium
- Danisco Animal Nutrition – Phyzyme XP®, Betafin®, Avizyme®, Porzyme®
- Terra Industries – Feed Grade Urea Liquor
- BASF – Attapulgitte Clay – Mineral suspension agent
- Blair Ag, L.L.C. – Liquid Clay, 10-34-0



Feed costs too high?



This is just one of the challenges that Danisco can help you solve.



When the pressure's on, turn to Danisco. As leaders in delivering the greatest value from Avizyme, Porzyme and Phyzyme XP feed enzymes and Betafin feed betaine, we are able to offer both the ingredients and expert knowledge to help keep your feed costs to a minimum.



Danisco - more profit from lower feed costs

To find out more please contact
Danisco Animal Nutrition, USA
info.animalnutrition@danisco.com

Tel: +1 314/771-7766
www.danisco.com/animalnutrition

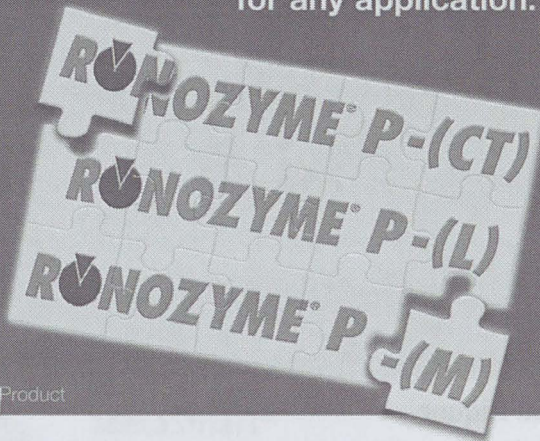
DANISCO

First you add knowledge...

Gold Sponsors – continued

SAFETY • QUALITY • RELIABILITY • TRACEABILITY

Don't be puzzled – it's Ronozyme® P
for any application.



DSM Product

RONOZYME® P

Product forms to match your needs.

The Improved Ronozyme® P Product Family

For processed or non-processed feed,
we have the phytase to meet your needs.

Ronozyme P -(CT) - Patented coating technology
keeps phytase effective even under extreme
conditions. Ideal for pre-processing addition
to pelleted feeds

Ronozyme P -(M) - high potency and easy to
handle, this dustless form was specifically
designed for use in premixes, base mixes and
dilutions used for non-processed feeds.

Ronozyme P -(L) - perfect for post-processing
spray applications, the product has excellent
shelf life and handles well.

Combine these formulation options with the
feed cost savings and environmental benefits
of Ronozyme P and your phytase choice is clear.

Learn more. Contact your DSM Nutritional
Products Manager or visit our website
at unlimitednutrition-na.dsm.com.

Unlimited. **DSM**

HARVEST INNOVATION

- More than 100 lawyers focused on the food, agriculture and biofuels industry
- Representing more than 10 percent of companies in the DAXglobal® Agribusiness Index
- Acting as trial, special or supervising counsel in agribusiness litigation in more than 30 states

More than 500 lawyers in the United States, England and China.



MORE TOGETHER
www.faegre.com

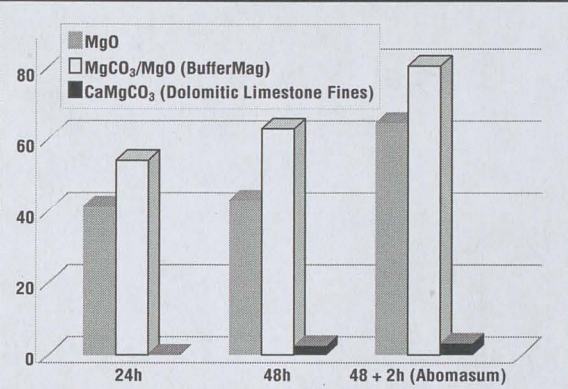
**BUFFER
MAG**

Feed Grade



An effective buffer and mineral source, BufferMag helps promote a healthy rumen environment and adequately supplies magnesium for healthier cows. BufferMag is an economical, effective, palatable feed supplement and an affordable alternative in partial replacement of magnesium oxide and dolomite limestones.

In Vitro (Ruminal+ Abomasal System) Magnesium Solubility %



Solubility (%) of mineral buffer Mg in rumen after incubation for 24h and 48h followed by 2h with addition of pepsin-HCl.

Feed Products North, Inc. ♦ 1300 McKnight Road North ♦ Maplewood, MN 55119 ♦ 1-800-625-6079 ♦ 651-777-3132 ♦ 651-777-8939 Fax

The **Hormel Agri-Nutrition Division** of Hormel Foods Corporation manufactures and sells feed products and commodities for swine, and dairy and beef cattle. The commodities include choice white grease, porcine meat and bone meal, and porcine blood meal. Among the feed products offered are premixes, base mixes, supplements, and pelleted starters for all species of livestock.



www.hormelfeeds.com

Hormel Foods Corporation – Feed Division

Larry Dunn / Dennis Dieterich

One Hormel Place

Austin, MN 55912

800-533-2228 (toll free)

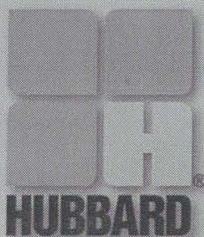
507-437-5264 (local)

lrdunn@hormel.com

Gold Sponsors – continued

Hubbard Feeds Inc. is an excellent nutrition partner for your operation – with innovative feed solutions that really work, and a wide network of dealers who make it their business to understand yours. The result is so much more than just another feed company.

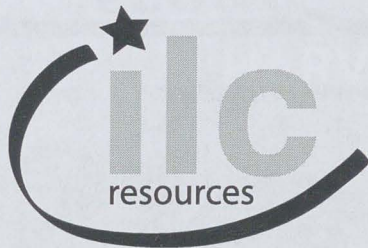
- New Standards for Quality
 - Personalized Service
 - Innovative Product Development
 - Building Trust, Delivering Solutions



Products and Answers that WORK[®]

www.hubbardfeeds.com

Solid as a Rock



We've provided feed ingredients to the poultry and livestock industries in the central U.S. and Canada since 1924.

- feed-grade calcium
- feed phosphates
- potassium products
- bentonite

Contact us for assistance with ingredient storage and logistics and brokering of product transportation.

Serving you from

Alden, Iowa • Gilmore City, Iowa • Weeping Water, Nebraska
Savage, Minnesota

For more information

Call 1-800-247-2133 or e-mail info@ilcresources.com

ILC Resources
10536 Justin Drive
Urbandale, IA 50322

1-800-247-2133
Fax: 1-515-244-3200
www.ilcresources.com

Customers can place orders and access mineral nutrition information online.

Gold Sponsors – continued

Research. Relationships. Results.™



We are Customer Focused, Solution Driven and Offer Dynamic Nursery Nutrition Products.

JBS United is steadfastly committed to the development of animal nutrition and production technologies designed to bring value to our swine production management customers.

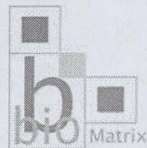


(800) 382-9909 • www.JBSUnited.com

KSI Kindstrom-Schmoll
INCORPORATED.

Proudly bringing New Technologies and Technical Support to the Poultry Industry through Ajinomoto Heartland LLC, BioMatrix International, Kerry, Inc., Nutra-Flo Company and partner Nutraferma.

AJINOMOTO. Value beyond product and price.



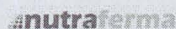
bioSecure™ BacTrac and Gantic. Applying Science and Technology Naturally™ for



Serving the industry through it's line of **Feed Improvers™** including **AlphaGal™170**, a new and unique enzyme for soy based diets



Nutra-Flo Company Feed Phosphates setting the standard on availability and purity



Producer of PepSoyGen, a fermented soy protein ingredient, and direct fed microbials produced using state of the art fermentation techniques



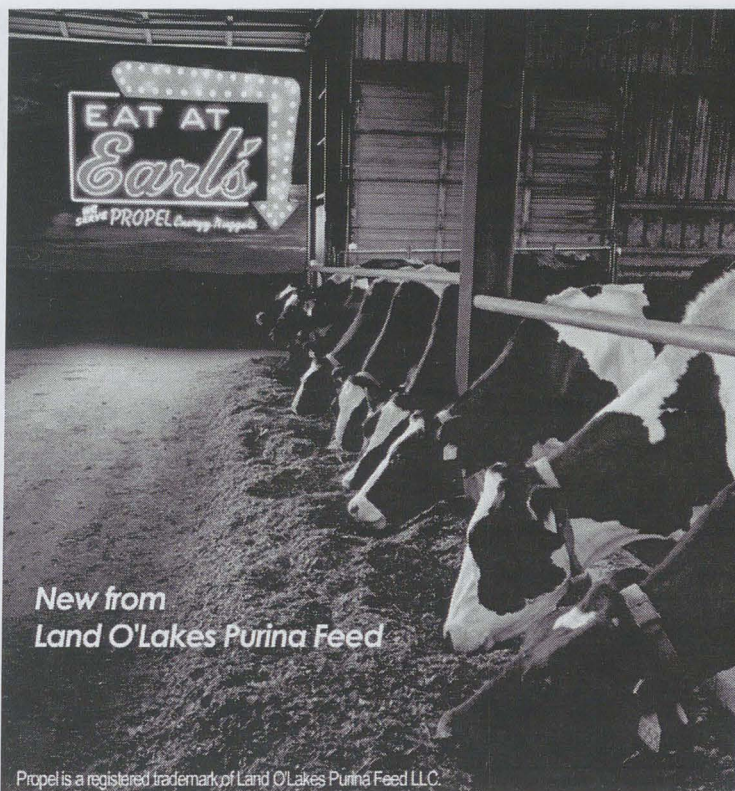
THANKS FOR YOUR BUSINESS!

Kindstrom-Schmoll, Inc.
PO Box 44459
Eden Prairie, MN 55344
800.634.8489

Specialty Ingredients Company
PO Box 448
Sycamore, IL 60178
800.332.4581

www.kindstrom-schmoll.com

Gold Sponsors – continued



New from
Land O'Lakes Purina Feed

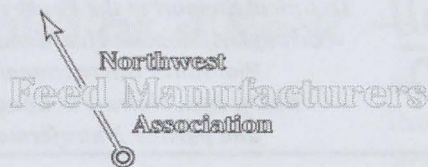
Propel is a registered trademark of Land O'Lakes Purina Feed LLC.

OVERCOMING INTAKE CHALLENGES JUST GOT EASIER.

Reduce early lactation challenges with Propel® Energy Nugget, a more palatable energy source than calcium salts or prilled fat products. Macro-Encapsulation™ technology produces a protected energy nugget that improves your herd's body condition, reproductive performance and profit potential.

For more information,
call 800-375-8766 or 806-761-7201,
visit www.propelnugget.com,
or contact your nutrition specialist.

PROPEL®
ENERGY NUGGET



The Northwest Feed Manufacturers Association

(first called the Northwest Feed Manufacturers & Distributors Association) was organized September 9, 1937, by a group of about 50 individuals interested in the feed business. It grew through successive

years and currently has a membership of about 100 firms and more than 250 individual representatives of these firms.

NFMA is a registered non-profit organization that strives for the betterment of the feed manufacturing industry by providing the opportunity for business and academic leaders of the agricultural community to interact and develop issues of common interest.

NFMA takes a leadership role in the critical area of encouraging tomorrow's leaders through the offering of scholarships to undergraduate students at the University of Minnesota, South Dakota State University, University of Wisconsin-River Falls and Iowa State University. A minimum of \$9,100 in aid will be given in 2008.

For further information, visit the association's web site at www.nwfeed.org.

Northwest Feed Manufacturers Association
12400 Whitewater Drive, Suite 160
Minnetonka, MN 55343

Cory Ploen
952-930-4340
coryp@qualitechco.com

Gold Sponsors — continued

A Healthy Immune System Starts with Good Nutrition.

A cow's natural immune system needs to be healthy to fight the stresses of:

- Production and reproduction
- Molds and mycotoxins in feed
- Pathogens in the environment

Maintaining a healthy immune system can:

- Reduce somatic cell count
- Reduce incidences of mastitis
- Reduce incidences of metritis
- Reduce death loss and culls

Make sure your herd's nutrition is optimal by feeding two ounces per cow per day of OmniGen-AF nutritional supplement.



PRINCE AGRI PRODUCTS, INC.

Advancing Nutrition for Healthy Animals®

Good Nutrition is Right Up Your Feed Alley, and Ours.

Advanced Formula
OmniGen-AF[®]
NUTRITIONAL SUPPLEMENT

Bunny Gegg, Area Sales Manager • bunny.egg@princeagri.com • (217) 257-0629

Reproductive
Performance
Shouldn't
be a Coin
Toss.



Flip the reproductive performance odds in your favor
with SQM[®] from Quali Tech, Inc.

The only trace mineral program that can be fed at 100% inclusion rates, SQM[®] trace minerals quickly improve reproductive performance, decrease rebreeding intervals and provides the most balanced health platform for your genetics to perform at their maximum potential. Whether you're raising high-quality beef, selling bulls and/or semen or standing in a show ring, SQM[®] assures your breeding program is no coin toss.

Only trace mineral that can be used at 100% inclusion rate — no need to add expensive sulfates.

- ✓ Vastly improved reproductive performance
- ✓ Better utilization of your mineral investment
- ✓ Backed by extensive research and in-field use
- ✓ Recommended by pure bred Angus breeders for more than 10 years

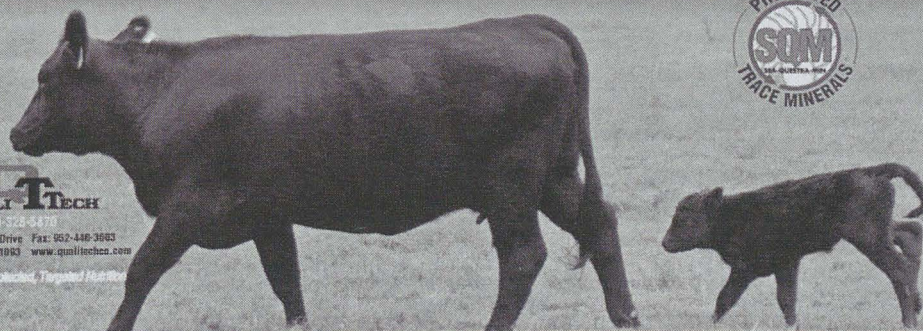
Don't bet your operation's reproductive efficiency on a coin-toss breeding program. Even the odds with SQM[®] trace mineral program and start reaping the benefits this season.



QUALI TECH
800-328-5470

310 Lake Hazeltine Drive Fax: 952-440-3083
Chaska, MN 55318-1093 www.qualitech.com

Quali Tech ... Protected. Targeted Nutrition.



Ralco Nutrition, Inc.

Delivering
KNOWLEDGE • INNOVATION • QUALITY

Helping our customers meet changing demands in animal nutrition and health through the practical application of knowledge and innovation.



RALCO NUTRITION, INC. • 1600 HAHN ROAD, MARSHALL, MN 56258 • 1-800-533-5306 • WWW.RALCONUTRITION.COM



Your Resource for
Innovative Solutions!

Are you ready for a consumer driven market? At Trouw, we are balancing your livestock's Health and Nutrition in a *World of Change...*

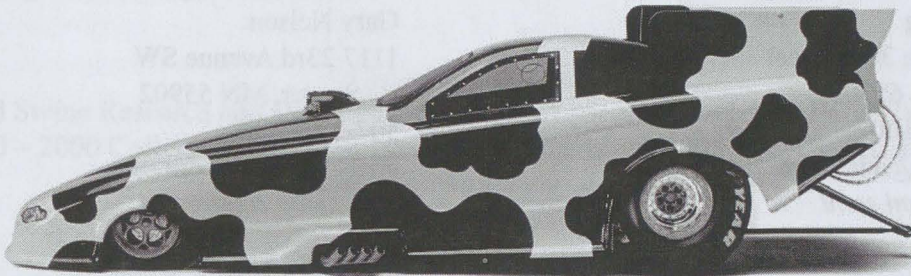
Premixes • Feed Ingredients • Specialty Products

800.328.8942

www.trouwnutritionusa.com

 **Trouw Nutrition**
INTERNATIONAL
Located in Willmar, MN

Gold Sponsors — continued



High performance cows need the right fuel

Experience the power of Vi-COR®

Vi-COR® keeps dairy operations firing on all cylinders. Our industry-leading products and services have helped thousands of dairies around the world improve feed efficiencies, increase milk production, and lower somatic cell counts. Take a look under the hood at www.vi-cor.com.



641.423.1460 • 800.654.5617 • Mason City, Iowa

Vi-COR® is a registered trademark of Varied Industries Corporation, Mason City, IA, USA ©2009 Varied Industries Corporation. All rights reserved.

Small Minerals. Big Impact.

Zinpro Performance Minerals®, fed at grams per day, deliver the highest quality trace minerals for your nutrition program. Industry-leading research shows that Zinpro Performance Minerals provide:

- Exceptional animal performance
- A consistent return on investment
- Long term profitability

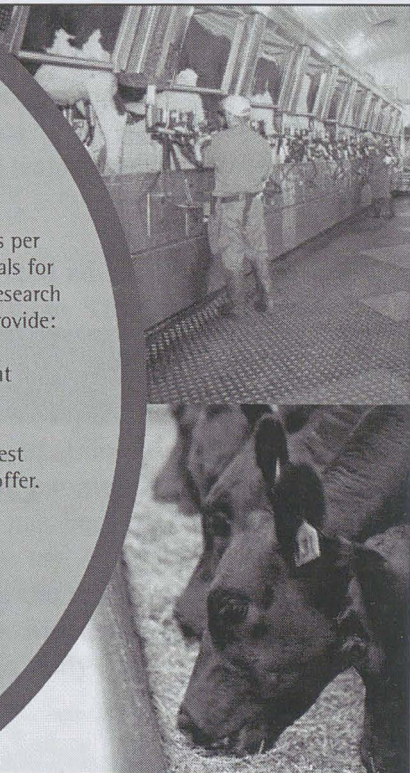
Zinpro Performance Minerals provide the best trace mineral package the industry has to offer.

Accept no substitutes. Talk to your feed supplier or nutritionist and ask for Zinpro Performance Minerals.

For more information:
Zinpro Performance Minerals
800-445-6145
www.zinpro.com/us



PERFORMANCE MINERALS®



Silver Sponsors

ADM Alliance Nutrition

Hong Yang
1000 North 30th Street
Quincy, IL 62301
217-222-7100
hong.yang@adm.com
www.admani.com/

Akey

Joe Loughmiller
207 Sisseton Drive
Fairmont, MN 56031
937-962-7038
jloughmiller@akey.com
www.akey.com/

Alltech, Inc.

Devin Hyde
700 32nd Avenue South
Brookings, SD 57006
859-537-0225
dhyde@alltech.com
www.alltech.com/

Alpharma Animal Health

Jim Anderson
1125 Wyland Drive
Dell Rapids, SD 57022
jim.anderson@alpharma.com
www.alpharmaah.com/

International Ingredient Corporation

Gary Nelson
1117 23rd Avenue SW
Rochester, MN 55902
507-252-5680
gnelson@iicag.com
www.iicag.com/

MIN-AD, Inc.

Larry D. Carritt
3131 Bell Street, Suite 101
Amarillo, TX 79106
402-689-7273
lcarritt@tconl.com
www.min-ad.com/

Stearns DHIA Laboratories

Dave Amundson
825 12th Street South, PO Box 227
Sauk Centre, MN 56378-0227
800-369-2696 (toll-free) 320-352-2028 (local)
davea@stearnsdhialab.com
www.stearnsdhialab.com/

Vita Plus Corporation

Dean Koehler
485 Ash Street East
Shakopee, MN 55379-3501
952-233-0444
dkoehler@vitaplus.com
www.vitaplus.com/

CD Sponsor

Land O'Lakes Purina Feed LLC

Ed Beaver
1080 County Road F West
Shoreview, MN 55126-2910
651-765-5530
eebeaver@landolakes.com
www.lolfeed.com/