WHAT IF...

A 40,000 LB ROLLING HERD AVERAGE WAS THE NEW NORM?
JC-KOW Farms has the highest rolling herd average (RHA) in Wisconsin and possibly the country. His 200-cow herd has a 305 day average of 40,280 pounds of milk, 1200 pounds of protein and 1330 pounds of fat on three-times-a-day milking. He grew his herd from within improving each generation with genetic selection while never forgetting the importance of good feed, cow comfort, and attention to detail.
Maybe 40,000 is not your goal, no matter what your goal may be, what’s keeping you from achieving it?
Are you embracing new technologies?
Are you utilizing the best genetics?
ARE YOU FOCUSING ON FEED EFFICIENCY AND MANAGEMENT?
Are your cows comfortable?
Are you making the most of your resources?
ADDITIONAL NOTES
WHAT IF...

You could get better...

REPRODUCTION?
IMMUNITY?
FEED CONVERSION?
HEALTH & PERFORMANCE?

34 years of innovation have made it possible.

We want to help you achieve your goals. Together we can change “What If” to “We Can.” Contact us today.
WHERE INNOVATION COMES NATURALLY

At Alltech, our mission is to improve the health and performance of people, animals and plants through nutrition and scientific innovation.

Founded by Dr. Pearse Lyons in 1980, and headquartered in Kentucky, U.S., Alltech provides natural, nutritional solutions to the food and feed industries in North America, Europe, the Middle East, Latin America and Asia-Pacific. Its mission is supported by more than 3,000 employees in 128 countries. Alltech’s global presence is also reflected in its research and production, including three major Bioscience Centers in the U.S. and Ireland and 32 production facilities strategically located throughout the world.

Alltech improves health and performance by adding nutritional value naturally through its innovative use of yeast fermentation, enzyme technology, algae and nutrigenomics. The company’s pursuit of this mission is guided by its founding ACE principle, our promise that in doing business we have a positive impact on the Animal, the Consumer, and the Environment.

Alltech is the only privately held company among the top-10 animal health companies in the world. This is a source of competitive advantage, allowing Alltech to stay focused on customer needs, innovation and long-term objectives. The flexibility has also fueled Alltech’s growth, which has been approximately 20-25% annually. The company is approaching $1 billion in sales and is on target to achieve $4 billion by 2016.

NATURAL SOLUTIONS FOR AN EVOLVING MARKET

Alltech’s core business is animal nutrition and aquaculture, which generates 95% of sales. We work with the largest feed manufacturers in the world and provide them with nutritional technologies that not only improve the bottom line, but are natural and friendly to the Animal, the Consumer, and the Environment.

Our company also has a growing consumer division that capitalizes on its passionate commitment to scientific innovation, particularly nutrigenomics and yeast fermentation technology. Products range from Lyons Farm™ premium meats, to a line of award-winning beverages, including Kentucky Bourbon Barrel Ale® and Town Branch® bourbon.
<table>
<thead>
<tr>
<th>BRANDS</th>
<th>SPECIES</th>
<th>INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actigen™</td>
<td>Dairy, Beef, Pig, Poultry, Equine, Pets and Aqua</td>
<td>Actigen is a cost-effective, safe and traceable new technology developed through nutrigenomics that helps animals of all species to thrive and reach their genetic potential.</td>
</tr>
<tr>
<td>AllzymeSSF</td>
<td>Pig, Poultry and Aquaculture</td>
<td>A natural complex that improves profitability through maximizing nutrient release. Produced by solid-state fermentation using a strain of non-GMO Aspergillus niger. Not available in EU 27.</td>
</tr>
<tr>
<td>BIO-MOS™</td>
<td>Dairy, Beef, Equine, Pig, Poultry, Pets and Aquaculture</td>
<td>Derived from a specific strain of yeast to feed the gastrointestinal tract, optimizing animal performance. Scientifically proven and supported by more than 500 research trials, including 100+ peer-reviewed publications.</td>
</tr>
<tr>
<td>BIONPLEX®</td>
<td>Dairy, Beef, Equine, Pig, Poultry, Pets and Aquaculture</td>
<td>Organic trace minerals designed to optimize reproductive efficiency, rapid growth and general animal health. Supported by more than 20 years of research.</td>
</tr>
<tr>
<td>DEMP</td>
<td>Ruminants</td>
<td>A natural protein source for ruminants that closely mimics microbial protein, thereby directly escaping rumen degradation.</td>
</tr>
<tr>
<td>De-Odorase®</td>
<td>Dairy, Beef, Equine, Pig, Poultry</td>
<td>A true innovation based on extracts from the Yucca plant. De-Odorase is an in-feed control agent for livestock odors.</td>
</tr>
<tr>
<td>Economax</td>
<td>All major livestock species</td>
<td>A proprietary blend of ingredients that maximizes the antioxidant capacity of animals and was the first breakthrough solution from our Nutrigenomics Center.</td>
</tr>
<tr>
<td>Optigen</td>
<td>Dairy and Beef</td>
<td>Alltech’s non-protein nitrogen (NPN) source for ruminants. A widely accepted solution to feeding and environmental problems.</td>
</tr>
<tr>
<td>INTEGRAL A+</td>
<td>Dairy, Beef, Pig, Equine, Pets and Aquaculture</td>
<td>Integral A⁺ is a natural solution to help animals achieve their true potential. This highly successful technology has proven efficacy in more that 55 peer-reviewed in-vivo (on animal) trials and is supported by 16 PhD and 19 Masters theses. Integral A⁺ is patented, which protects its novel composition and methods of production.</td>
</tr>
<tr>
<td>NUPro®</td>
<td>Pigs, Poultry, Ruminants, Aquaculture, Pets</td>
<td>A functional protein from yeast, manufactured by a proprietary Alltech process and containing highly concentrated levels of essential and functional nutrients that are important in the diets of young animals.</td>
</tr>
<tr>
<td>LIFEFORCE</td>
<td>Equine</td>
<td>A daily natural nutritional supplement to maintain a healthy horse at every stage of life.</td>
</tr>
<tr>
<td>SEL-PLEX®</td>
<td>Dairy, Beef, Pig, Poultry, Equine, Pets and Aquaculture</td>
<td>Alltech’s proprietary organic selenium yeast. The only FDA-reviewed and the first EU-approved form of organic selenium. (Selenium is vital to combat reproductive, growth, health, and immune system challenges.)</td>
</tr>
<tr>
<td>Yea-Sacc®</td>
<td>Ruminant, Pig and Equine</td>
<td>A live yeast culture that helps improve animal performance. Low inclusion rate and a large body of supporting research clarify its mode of action and performance response.</td>
</tr>
</tbody>
</table>
Helping your Animals Reach their Full Potential

As dairy producers we realize that, raising a high producing healthy herd of dairy cattle is more than simply feeding, breeding, milking and repeat. Employee training, forage and milk quality, growing nutritional needs, mycotoxins, and stall or barn design are just a few of the many concerns that farmers face on a daily basis. As challenging as tackling all of these issues may seem, the Alltech On-Farm Support Program can help. A tool for dairy farmers across North America, this program provides support to farmers in reaching goals, solving problems, troubleshooting and helping to lay a foundation for a profitable and sustainable future. Combining more than 30 years of research, premium quality products, and committed dairy experts, the Alltech On-Farm Support Program is proving profitability across North America, and is a must-have for your dairy team.

Dairy Audits

From stall design to milk quality, the dairy audit program looks at every piece of the puzzle for a successful dairy, making sure that each component is promoting profitability while offering practical solutions.

- Milk quality
- Immunization practices
- Cow comfort in parlor
- Udder hygiene
- Parlor and barn lighting
- Air quality in barn
- Stall design
- Dry cow and close up facility
- Feeding schedules
- Waterers
- Stray voltage
- Bunkers

Providing Solutions through Premium Products

With a core business in yeast technology, Alltech offers a range of products and solutions to meet the needs and issues that dairy producers face on a daily basis. By promoting profitability and overall health and production in your dairy herd, whether it be animal performance or your bottom line, you can truly see the benefits that Alltech products can offer. Ask your feed provider for Alltech products in your dairy ration.

Activating the Nutritional Power Within

Alltech is bridging the gap between science and the farm. Being a leader in research and nutrigenomics has helped Alltech bring necessary solutions to the animal production industry through nutrition. By understanding the effect of what you feed at the gene level through nutrigenomics, Alltech is helping dairy herds to reach their true genetic potential.
Workshops and Training

Labor management has proven to be a challenge for dairy producers across the North America, and for many having inexperienced milkers, or milkers unfamiliar with your system is extremely common. By doing a customized workshop for your team, you can assure that all employees are on the same page, following the same protocols and routines. Not only telling your employees the proper procedures, but helping them to understand the reasoning for these procedures is key to a quality team.

Removing the Language Barrier

The objective of this national program is to increase the efficiency of the dairy industry’s labor force through bilingual training and education of farm employees. This course is designed to provide an opportunity for dairy managers, consultants and feed manufactures to develop teamwork and to improve targeted areas that contribute to the success of the dairy operation.

Events

Bringing the most progressive dairy producers together and discussing key issues in the dairy industry is something that can be seen at multiple Alltech events throughout the year. By promoting education and networking with producers from across the globe, Alltech partners with farmers to talk about issues, and help to find solutions. Ask your local Alltech representative about an Alltech event in your area.

Alltech can detect and address the risks caused by over 37 different mycotoxins with confidence using a holistic approach to managing your mycotoxin challenge. The program evaluates multiple mycotoxins using ultra performance liquid chromatography coupled to tandem mass spectrometry (UPLC-MS/MS) methodology developed at Alltech’s Global Research Headquarters, KY, USA. Compared to other commercial methods that have a very narrow window of mycotoxin targets this approach represents a real breakthrough as it identifies an important variety of mycotoxins that can potentially contaminate a feed material.

Dairy Heroes

Alltech Dairy Heroes celebrates the important role dairy farmers play in food production, while recognizing those that go the extra mile to get the job done and put milk on the table. Alltech Dairy Heroes offers a social platform for producers to share stories, discuss issues, and generate solutions through producer networking while recognizing those producers that go above and beyond. Celebrate your Dairy Heroes at facebook.com/dairyheroes and dairyheroes.com

Alltech.com  AlltechNaturally  @Alltech
Protecting your valuable forages and keeping your herd healthy:

1. Incorporate a protective feeding program
2. Forage storage audit and management plan
3. Quarterly mold and yeast counts and ID's
4. Alltech's 37+ mycotoxin screening
5. Monthly visits with an infrared camera

**ALLTECH ON-FARM SUPPORT**

The objective of this national program is to increase the efficiency of the dairy industry's labor force through bilingual training and education of farm employees. This course is designed to provide an opportunity for dairy managers, consultants and feed manufactures to develop teamwork and to improve targeted areas that contribute to the success of the dairy operation.

Such as:

- Dairy Audits
- Education through milking technician, calving, fresh cow and calf management schools
- Education through milk quality presentations

**ALLTECH'S 37+ MYCOTOXIN SCREENING**

The objective of the 37+ Program is to evaluate North America feedstuffs for multiple mycotoxins using ultra performance liquid chromatography coupled to tandem mass spectrometry (UPLC-MS/MS) methodology developed at Alltech's Global Research Headquarters, KY, USA. This approach represents a real breakthrough compared to other commercial methods that have a very narrow window of mycotoxin targets compared to the important variety of mycotoxins that can potentially contaminate a feed material.

**ALLTECH SOUTH DAKOTA FERMENTATION LABORATORY**

The In Vitro Fermentation Model (IFM) was established to develop a precise method of measuring digestion and fermentation kinetics in vitro. This analysis allows for a more accurate approach in formulating beef and dairy rations with the inclusion of Alltech’s unique technologies.

Our Laboratory Capabilities:
1. Computerized in vitro gas production system.
   - Pressure transducers with the ability to live-track gas pressure changes during fermentation
   - Estimate digestion kinetics and dry matter digestibility
2. Measures by products of fermentation
   - Energy substrates – volatile fatty acids
   - Microbial biomass
   - Waste products (greenhouse gases) – methane, carbon dioxide
3. Measures chemical composition of feeds
   - DM, ash, CP, protein fractions, NDF, ADF, EE, starch
4. Measuring the effects of Alltech's technologies in vitro

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Alltech Wisconsin
331 W. Kindt Street, Juneau, WI 53039
Phone: (920) 386-9651
Email: alltechwisconsin@alltech.com

@Alltech
Guidelines (based on Dairy TMR’s)

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast Pool (FP)</td>
<td>68.0</td>
<td>52.6-95.8</td>
</tr>
<tr>
<td>FP Kd</td>
<td>14.50</td>
<td>10.47-20.81</td>
</tr>
<tr>
<td>Slow Pool (SP)</td>
<td>110.0</td>
<td>83.8-136.2</td>
</tr>
<tr>
<td>SP Kd</td>
<td>4.15</td>
<td>3.55-4.93</td>
</tr>
<tr>
<td>2-Pool total</td>
<td>177.0</td>
<td>150.7-213.0</td>
</tr>
<tr>
<td>FP, % Total</td>
<td>38.0</td>
<td>28.5-48.8</td>
</tr>
<tr>
<td>SP, % Total</td>
<td>62.0</td>
<td>51.2-71.6</td>
</tr>
<tr>
<td>Starch, Kd</td>
<td>10.03</td>
<td>7.94-13.4</td>
</tr>
<tr>
<td>Time to Max FP Kd</td>
<td>3.80</td>
<td>2.50-5.42</td>
</tr>
<tr>
<td>Time to Max SP Kd</td>
<td>12.35</td>
<td>10.25-14.50</td>
</tr>
<tr>
<td>ADM, %</td>
<td>68.3</td>
<td>60.5-78.6</td>
</tr>
<tr>
<td>TDMD, %</td>
<td>79.3</td>
<td>71.9-86.5</td>
</tr>
<tr>
<td>MBM, mg/g DM</td>
<td>128.0</td>
<td>90.0-195.6</td>
</tr>
<tr>
<td>PF</td>
<td>4.50</td>
<td>3.93-5.19</td>
</tr>
</tbody>
</table>

### Sample Results

<table>
<thead>
<tr>
<th>Digestion Rates</th>
<th>Relative proportion of pools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kd (%/h)</td>
<td>Relative time to max.,h mL/g DM</td>
</tr>
<tr>
<td>Starch, B1</td>
<td>11.45</td>
</tr>
<tr>
<td>Fast Pool, A, B1, B2</td>
<td>18.72</td>
</tr>
<tr>
<td>Slow Pool, B3</td>
<td>4.47</td>
</tr>
<tr>
<td>2-Pool total</td>
<td></td>
</tr>
</tbody>
</table>

| ADMD, %         | 72.7                          |
| TDMD, %         | 80.8                          |
| PF              | 4.02                          |
| Microbial biomass, mg/g DM | 93.1                      |

<table>
<thead>
<tr>
<th>VFA% of Total</th>
<th>Sample</th>
<th>Average</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic Acid</td>
<td>42.46</td>
<td>44.62</td>
<td>38.3-51.5</td>
</tr>
<tr>
<td>Propionic Acid</td>
<td>30.18</td>
<td>33.40</td>
<td>28.2-39.4</td>
</tr>
<tr>
<td>Isobutyric Acid</td>
<td>0.95</td>
<td>0.77</td>
<td>0.26-1.09</td>
</tr>
<tr>
<td>Butyric Acid</td>
<td>19.81</td>
<td>16.70</td>
<td>14.0-21.1</td>
</tr>
<tr>
<td>Isovaleric Acid</td>
<td>2.44</td>
<td>1.45</td>
<td>0.32-3.65</td>
</tr>
<tr>
<td>Valeric Acid</td>
<td>4.16</td>
<td>3.00</td>
<td>1.18-4.50</td>
</tr>
</tbody>
</table>

The suggestions/recommendations from the Analysis Report are based on the information and material the Customer has provided for the requested Service. The Company shall not be liable for any claim arising from any changes to the information disclosed by the Customer on the Submission Form.
More than 500 mycotoxins have been identified in feeds and feed ingredients to date. However, only a few have been tested in the field. Although the type of mycotoxin tested depends on the toxin prevalence, aflatoxins are analyzed around the world because of their carcinogenic properties. South Asian feed mills sometimes also test for ochratoxin A and T-2 toxin if the standards are available. In North America, deoxynivalenol (vomitoxin or DON) is widely tested with occasional testing of T-2 toxin, zearalenone and fumonisins. Thin Layer Chromatography (TLC) and ELISA are the common methods employed for these tests at feed mills and laboratories.

Since one mold can produce several mycotoxins and several molds can be present in one feedstuff, it is expected that there are likely more mycotoxins present than are being tested. To give an example, if a sample contains DON there are chances for the presence of several other mycotoxins including 3-acetyl DON, 15-acetyl DON, fusarenon-X etc. As these toxins can contribute to the toxicity of DON, not analyzing them will give a false sense of security. The same thing applies for aflatoxins, T-2 toxin related compounds, fumonisins and ergot toxins. As a result the ability to analyze as many toxins as possible at an affordable cost and in a timely manner will assist in better understanding of total toxicity to animals as well as developing preventive solutions.

What mycotoxins should be tested?

Although it is not practical to analyze all the known mycotoxins in animal feeds and feed ingredients, the following mycotoxins should be considered due to their prevalence and animal toxicity.

- Aflatoxins: B1, B2, G1, and G2
- Ochratoxins: A and B
- Type B Trichothecene Mycotoxins: DON, 3-acetyl DON, 15-acetyl DON, Nivalenol, Fusarenon-X, masked DON
- Type A Trichothecene Mycotoxins: T-2 toxin, DAS, HT-2 toxin, Neosolaniol
- Fumonisins: Fumonisin B1, B2 and B3
- Zearalenone
- Silage mycotoxins: Patulin, roquefortine C, penicillic acid, gliotoxin, mycophenolic acid
- Ergot mycotoxins: 2-bromo-alpha-ergocryptine, ergocornine, ergometrine, ergotamine, lysergol, methylergogonovine

A broader analytical approach

The mass spectrometry technique - LC-MS2 - utilizes the high sensitivity and selectivity of liquid chromatography to dramatically enhance the definition and quantification of mycotoxins in complex matrices such as feedstuffs. This technique combines separation capabilities (LC) with the accurate detection of mass particles (MS). MS/MS is a mass spectrometer capable of doing several rounds of mass spectrometry separated by mass fragmentation. This approach allows the recording of the analyte's atomic mass or fragments and its unequivocal assignment with its fragmentation enabling its specific fingerprinting.

The successful addition of the LC-MS2 analytical technique to Alltech's core competencies allowed the development of analytical methods investigating more than 30 different mycotoxins quantitatively, and more than 50 others qualitatively in less than 15 minutes per sample analyzed with limits of detection in the ppt range. Patterns of contamination are now investigated in feed matrices to better capture mycotoxin profiles and the associated risks for the animal consuming contaminated feed material.

In order to provide a better understanding of the mycotoxin challenges, Alltech India has collaborated with Bangalore Veterinary College to analyze 14 mycotoxins in feeds and feed ingredients. The use of state of the art LC-MS2 equipment to analyze multiple mycotoxins simultaneously has never been done before in the Indian poultry industry. With the procurement of more mycotoxin standards, this facility, like the Alltech lab in Lexington, KY in the US, can extend the capability to analyze 37 mycotoxins. This approach represents a real breakthrough compared to other commercial methods that can only see “snapshots” of the contamination with limitations in the number of toxins detected, selectivity, and sensitivity for given biological matrices.
The Mycotoxin Management Program Advantage

Alltech’s Mycotoxin Management Program represents the revolution in mycotoxin management. This multiple mycotoxin control program is designed to reduce risk and improve safety, while ensuring mycotoxins do not limit livestock performance and profitability, or pose a threat to the food chain.

How is the Mycotoxin Management Program different?

Alltech’s Mycotoxin Management Program was developed to create a network of mycotoxin consultants and researchers around the world and to develop technologies to manage the menace of multiple mycotoxins by utilizing the following five-step approach:

• **MIKO Mycotoxin Hazard Analysis Program**- Designed to help improve production and profitability systems at the feed mill and farm level.
• **37+ Program**- Analyses for multiple mycotoxin contamination in a given feed sample enabling a more thorough understanding of the associated risk to the animal.
• **Risk Assessment and Toxic Equivalent Quantities**- Provide a more accurate picture of the mycotoxin contamination of a given feedstuff and estimates the total potential impact of mycotoxins in the sample.
• **Remediation**: Given that multiple mycotoxins are often found in naturally-contaminated feeds and forages, it is important that a broad spectrum solution be considered. Using proprietary techniques, we are able to demonstrate how utilizing the MMP can help to reduce the threat posed by multiple mycotoxins.
• **Recommendation**: With the improved risk assessment and remediation supported by the 37+ Program and MIKO audits, where applicable, tailored recommendations for the use of the MMP are given based on the species and severity of mycotoxin contamination.

How do I know there is a problem?

Forages and feeds
- Are you feeding high dry matter forages?
- Is there any spoilage contamination of/in your forages?
- Is there evidence of spoilage or heating in any feedstuffs?
- Were there any unusual pre/post-harvest weather conditions?
- Have you seen any signs of pest infestation?
- Has poor performance coincided with any dietary changes?
- Has there been any variability in feed intake?
- Has there been a reduction in fertility or an increased number of abortions?

Herd health and performance
- Has there been any inconsistency in milk yield?
- Has there been an increase in disease incidence?
- Are your cows showing symptoms of acidosis?
- Have you noticed any inconsistency in manure quality?
- Do you have any other unexplained concerns?

If you checked any of the boxes above, it is possible your herd may be facing a mycotoxin challenge.

What should I do now?

Take the Mycotoxin Management Program Challenge!
ARE YOU INTERESTED IN...

...increased feed efficiency leading to a savings of 11 cents per cow/per day with alfalfa?

...more milk production totaling $800 per acre of corn silage produced?

...increased corn yields of between ½ ton and a ton per acre?
Harvest Data: Agri-Tech Consulting, USA / Dr. T.S. Maloney

- Applied to corn at 8 oz/acre at the 4 leaf stage (V4)

**Milk Yield Per Ton of Silage**

<table>
<thead>
<tr>
<th>Lbs Milk/Ton silage</th>
<th>Control</th>
<th>Grain-Set®</th>
</tr>
</thead>
<tbody>
<tr>
<td>2750</td>
<td></td>
<td>&gt;5.5% Gain</td>
</tr>
<tr>
<td>3000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3750</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Milk Yield Per Acre**

<table>
<thead>
<tr>
<th>Lbs Milk/Acre</th>
<th>Control</th>
<th>Grain-Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>72000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>78000</td>
<td></td>
<td>11% Gain</td>
</tr>
<tr>
<td>84000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When 40 mph winds hit Chadwick, Illinois in 2012, the stalks treated with Grain-Set® remained standing while many of the untreated stalks had fallen over.

**Nutrient Analysis 2012**

- NDF
- Starch
- Sugar
- Crude-fibre
- Crude protein
- VCDS (%)
- DEB
- DVE
- VEM
- Dry matter %

**Harvest Data: Heemskerk, The Netherlands**

- Applied to corn at 6-9 leaf stage
- 1 oz/cob average weight increase
- 900 lbs/acre yield increase
- 10% increase in starch
- 8% increase in energy (VEM)
- Predicted Milk Yield: 12 – 34 fl oz increased milk / head / day

Scan here to see the effects of Grain-Set® applied to corn.
MINERAL MANAGEMENT

MINERAL NUTRITION - DAIRY

Modern animal production needs a modern approach to mineral supplementation. The Mineral Management Program focuses on organic trace minerals that are better absorbed, stored and utilized by the animal. Alltech has proven that modern management of mineral nutrition can be carried out by inclusion at significantly lower levels, while also improving performance. This approach corresponds with the global environmental expectations of reduced mineral excretion.

Break through tradition and feed with organic minerals at lower inclusion levels based on advanced Total Replacement Technology (TRT). Setting the standard for dairy nutrition!

HISTORY OF MINERAL SUPPLEMENTATION

What type of mineral diet are you feeding your dairy cow?

<table>
<thead>
<tr>
<th>Inorganic minerals</th>
<th>On-top supplementation</th>
<th>Partial Replacement</th>
<th>Total Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>First form of mineral supplementation with 100% inorganic minerals</td>
<td>Inclusion of organic minerals on-top of inorganic minerals</td>
<td>Inclusion of 50% inorganic and 50% organic minerals</td>
<td>Modern mineral management with organic minerals only at lower inclusion levels</td>
</tr>
</tbody>
</table>

FEEDING A 100% ORGANIC MINERAL DIET CAN:
✓ Get the most out of your cows by optimizing milk production
✓ Contribute to reproductive performance
✓ Contribute to the nutritional value of milk
✓ Support healthy antioxidant status

THE MINERAL MANAGEMENT PROGRAM SUPPORTS:
• A highly efficient mineral diet
• The ability to feed minerals at lower rates
• Mineral excretion reduction
• Opportunity to better health and performance
Figure 1 illustrates that cows fed with Bioplex Copper had around a 1 log unit (10-fold) lower E. coli in milk compared with the other diets after intramammary challenge with E. coli. This demonstrates that the Total Replacement Technology program is more effective at supporting the animal’s natural defense system when cows are responding to a mastitis challenge.

Figure 2 highlights that Sel-Plex is shown to support the natural defense system in dairy cows. This is especially important around calving when the cow is exposed to a higher risk of infections. Cows fed organic selenium in the form of Sel-Plex compared with cows fed inorganic selenium are able to optimize their natural defense system twice as effectively around calving, a period where the cow’s defenses are weakened.

Sel-Plex is Alltech’s proprietary organic form of selenium manufactured to mimic Mother Nature, thus better absorbed and utilized by the animal than inorganic selenium.

Alltech’s Bioplex range of chelated organic trace minerals provides mineral nutrition in the form of zinc, copper, manganese, and cobalt as close to nature as possible.
MICROALGAE SUPPLEMENTATION
DAIRY NUTRITION

With the increasing demand for protein sources in animal feed, many nutritionists are considering the use of algae to supply needed nutrients in livestock diets. However, the field of algae is growing rapidly and through heterotrophic algae, nutritionists are finding a more natural, pure sustainable source of DHA, and high-quality fatty acids that are not only providing needed nutrients, but are revolutionizing the way we feed our livestock. Alltech has proven that particular species of algae are functional in nutrition availability.

HETEROTROPHICALLY GROWN ALGAE

What is the difference between heterotrophic vs. autotrophic algae in your herds diets?

Heterotrophically algae are grown in closed stainless steel fermenters providing high levels of sterility and process controls which allow us to produce a very consistent, traceable and efficient product.

HETEROTROPHIC
• Closed System
• Traceable
• Limited Contamination Risk
• Sustainable
• Protected by Alltech Quality System

AUTOTROPHIC
• Often Uses Waste Products for Nutrients
• High Contamination Risk
• Lack of Consistency
• Downstream Processing
• Environmental Conditions

SUPPLEMENTING YOUR HERDS DIET WITH MICROALGAE CAN:
• Optimize the health and performance of your herd
• Promotes natural DHA-enrichment
• Support healthy antioxidant status
• Contribute to the nutritional quality of the milk

ALLTECH’S ALGAL TECHNOLOGY SUPPORTS:
• A sustainable alternative to fish oil in animal diets
• Premium product offerings
• Increased profitability for the producer
• The opportunity to provide a higher quality, functional food that benefits consumer’s health.
FUNCTIONAL FOODS

Functional foods are foods with added benefits that improve the health, wellness and quality of consumers’ lives. The process of naturally enriching food products through animal supplementation creates large opportunities for differentiation with minimal investment. The improved quality offers larger profit margins than conventional foods.

Human benefits from DHA include:
- Better immunity
- Improved heart health
- Increased cognitive health
- Better visual development

Table 1: This graph displays the **persistency in milk production** during late lactation that the treated group displayed compared to that of the control group.

![Persistency in milk production graph](image)

- Trial conducted 104 through 188 days of lactation

Table 2: This chart displays a comparison of the milk yield response compared to that of the control group. This herd displayed an average **increase in milk production** by +1.86 lbs of milk.

<table>
<thead>
<tr>
<th>Trial periods</th>
<th>Control</th>
<th>ALGAE S® 6 g/kg DMI</th>
<th>ALGAE S® vs. Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-10 – D0</td>
<td>38.0</td>
<td>38.0</td>
<td>-</td>
</tr>
<tr>
<td>D1 – D7</td>
<td>37.3</td>
<td>38.1</td>
<td>+0.4</td>
</tr>
<tr>
<td>D8 – D14</td>
<td>36.5</td>
<td>37.8</td>
<td>+1.3</td>
</tr>
<tr>
<td>D15 – D21</td>
<td>37.4</td>
<td>39.3</td>
<td>+1.9</td>
</tr>
<tr>
<td>D22 – D28</td>
<td>36.3</td>
<td>38.4</td>
<td>+2.1</td>
</tr>
<tr>
<td>D29 – D35</td>
<td>37.2</td>
<td>39.0</td>
<td>+1.8</td>
</tr>
<tr>
<td>D36 – D42</td>
<td>36.7</td>
<td>38.2</td>
<td>+1.5</td>
</tr>
<tr>
<td>D43 – D49</td>
<td>36.2</td>
<td>36.8</td>
<td>+0.6</td>
</tr>
<tr>
<td>D50 – D56</td>
<td>36.5</td>
<td>37.9</td>
<td>+1.4</td>
</tr>
<tr>
<td>D57 – D63</td>
<td>35.7</td>
<td>37.3</td>
<td>+1.6</td>
</tr>
<tr>
<td>D64 – D70</td>
<td>33.0</td>
<td>35.8</td>
<td>+2.8</td>
</tr>
<tr>
<td>D71 – D77</td>
<td>30.9</td>
<td>34.8</td>
<td>+3.9</td>
</tr>
<tr>
<td>D78 – D84</td>
<td>31.5</td>
<td>34.6</td>
<td>+3.1</td>
</tr>
<tr>
<td>D1 – D84</td>
<td>35.4</td>
<td>37.3</td>
<td>+1.9</td>
</tr>
</tbody>
</table>

Mortacchini et al, 2013

Table 3: A significant change was identified in Omega 3’s, Omega 6’s, Omega 3/Omega 6, Saturated and Unsaturated fatty acids, DHA, and CLA’s.

<table>
<thead>
<tr>
<th>Milk fatty acid profile during the study (% of the Σ)</th>
<th>ALGAE S® 6 g/kg DMI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Omega 3</strong></td>
<td>0.52</td>
</tr>
<tr>
<td><strong>Omega 6</strong></td>
<td>2.54</td>
</tr>
<tr>
<td><strong>Omega 3 / Omega 6</strong></td>
<td>0.20</td>
</tr>
<tr>
<td><strong>Σ Saturated fatty acid</strong></td>
<td>71.89</td>
</tr>
<tr>
<td><strong>Σ Unsaturated fatty acid</strong></td>
<td>28.11</td>
</tr>
<tr>
<td>DHA</td>
<td>-</td>
</tr>
<tr>
<td><strong>CLA</strong></td>
<td>2.35</td>
</tr>
</tbody>
</table>

Alltech’s trial proves to have increased persistency and a consistent level of milk production throughout late lactation starting at 104 days. The trial also displays increases in other critical nutrients that show higher levels in the milk.

Giving dairy farmers an edge in a commodity market, and consumers a revolutionized nutritional platform.
Schedule of Events

Farm Innovation Series
Wednesday, March 19, 2014
Rochester Event Center
12:00 p.m. - 3:00 p.m.

Alltech's International Symposium
May 18-21, 2014

Global 500
August 30 - September 2
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Thank you for coming, please drive home safely!