

Regional Dairy Newsletter



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Emily Myers, CCE Regional Dairy Specialist

erm35@cornell.edu

Ph: 518-353-4949

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Balancing for Amino Acids - A New Nutritional Frontier

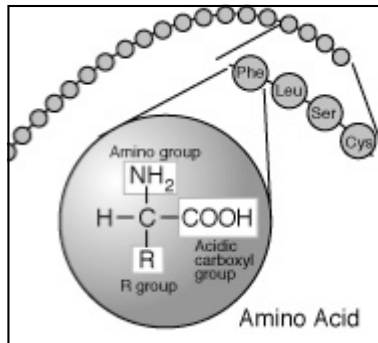
Emily Myers, Regional Dairy Specialist

At both the Cornell Nutrition Conference and the November Feed Dealer's Meeting there was considerable attention paid to balancing individual amino acids in dairy rations. The same phenomena that occurred with fat and carbohydrate is now occurring with protein.

New technologies and detailed feed analysis have resulted in greater knowledge of nutrient fractions, enabling nutritionists to break each fraction into its building blocks. In doing so, we now realize that it's not just fat that is important, but individual fatty acids; and not just carbohydrate that is important, but the components within different carbohydrates (such as sugar, starch, soluble fiber etc.) that are truly meaningful. Protein is now under intense scrutiny and there may be a great deal of cost savings and environmental implications involved in the rapidly approaching protein revolution.

First, some background on

protein and its composition. Protein is made of individual amino acids, which when linked together in a particular order, create different kinds of protein. The protein in meat is different than the protein in soy, which is different than the protein in milk (something that soy "milk"



drinkers should be aware of!). These differences are because of the different order and quantity of individual amino acids within the protein. Cows as well as all other animals, have requirements for amino acids that must be supplied by what they eat. **Lysine** and **methionine** are just two examples of these essential amino acids; two that I mention because they are most often deficient or "limiting" to milk production in dairy cow rations.

Lysine and methionine are often limiting because many of the feeds that we use in dairy rations have little lysine and methionine within their protein. Corn grain and corn products (distiller's grain) contain very little lysine, and soybean meal, which is often

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purchased to increase crude protein content of the ration, contains much less methionine than a lactating dairy cow needs. We also know that without adequate amino acids going in, you can't get a whole lot back out, meaning milk protein and milk volume will suffer.

Several recent studies in which amino acids were balanced to meet recommended levels (both in type and quantity) showed significant increases in total milk protein production. Increases in milk protein of 0.2 point are possible in circumstances where a deficiency exists. This may not sound critical, but an increase in milk protein of that scale could make balancing for amino acids on your farm a very worthwhile endeavor! In addition,

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the crude protein content of the diet can be decreased if the quality of the protein is improved, meaning feed costs and urea excretion could be reduced without reducing production of milk components.

Before continuing, let's put some money behind a 0.2% increase in milk protein. Milk protein is twice as valuable as milk fat and for a cow making 70 lbs a day, going from 2.9% to 3.1% protein would result in an increase in milk income of approximately \$0.36/cow/day based on October 2009 protein price. For a 100 cow dairy over a one year period, that's roughly \$13,140. Nothing to sneeze at, especially in the current economic situation.

Ultimately, each farm needs to talk to their nutritionist and inspect the ration for amino acid content to determine what kinds of protein may need to be added. On a farm where there is a severe deficiency of one amino acid in the ration, a small addition of that amino acid from a different protein source may result in a big increase in milk protein. On the farm next door, amino acids may already be in-line with cow requirements and addition of amino acids may result in no increase in milk protein. The profitability of balancing for amino acids will depend on the milk protein price, the resulting increase in milk protein, the severity of deficiency of an amino acid on each farm, and

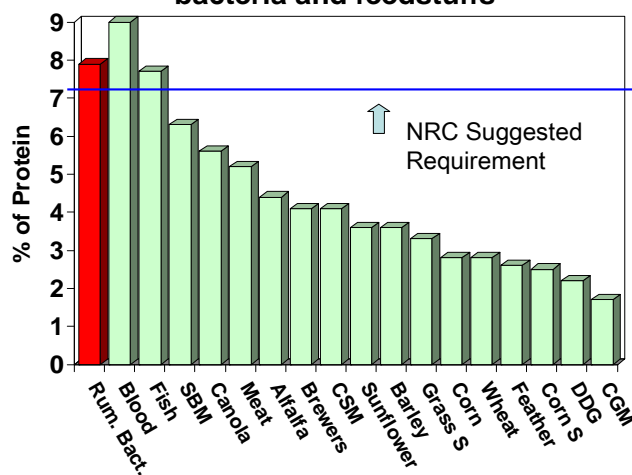
whether or not crude protein and feed costs can be decreased in the diet.

In addition, maximizing microbial protein production is by far the best and cheapest method of helping the cow provide her own essential amino acids, as microbial protein has an excellent amino acid profile. High microbial protein yield has other, far reaching implications as well, including efficient and thorough fiber fermentation and indications of overall rumen health. Providing rumen microbes with adequate energy and degradable protein will help to maximize their population. Diets with no corn silage or grain of any kind may be limiting microbial growth, especially if the quality of other feeds in the diet is questionable or poor.

Even rations in which microbial protein production is maximized however, cannot meet all of a high producing cow's essential amino acid requirements. The two charts

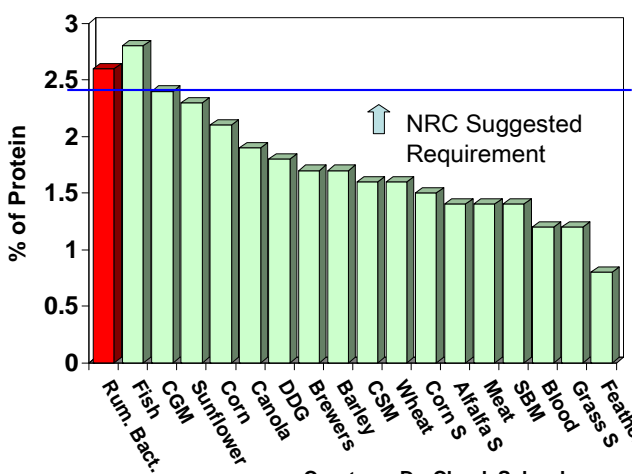
on this page show lysine and methionine content of several common feed ingredients compared to microbial protein. Microbial protein has excellent lysine and methionine levels and the amino acids it provides are absorbed and utilized very well.

Comparison of lysine in protein from rumen bacteria and feedstuffs



Courtesy of Dr. Chuck Schwab

Comparison of methionine in protein from rumen bacteria and feedstuffs



Courtesy of Dr. Chuck Schwab

Corn on the other hand is quite low in lysine, making a diet high in corn silage, corn grain and distiller's grain (DDG) one in which lysine may be severely limiting for the cow.

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Protein sources like blood or corn gluten meal (CGM) are going to be more expensive than distiller's or soybean meal, but when combined they will provide the amino acids that are limiting, instead of those that are already in excess, so you'll actually get more bang for your buck. Ultimately the crude protein content of the diet and the amount of protein purchased can be decreased when you are only buying the amino acids you really need!

Requirements

Currently the NRC recommendations for a lactating dairy cow for lysine and methionine are 7.2% and 2.4% of metabolizable protein (not

crude protein). This makes for a ratio of 3:1 for lysine:methionine, which has long been used in the nutrition industry. The total amount of each amino acid consumed by the cow is just as important as the ratio however, which is a new way of thinking. It is also important to note that rations need to be balanced in a software program where amino acids are taken into account. The CPM and CNCPS systems both contain feed libraries where amino acid content is available, as do some systems used by commercial nutritionists. If your farm is experiencing low milk protein, it may be time to discuss your options with your nutritionist, sit down with a pencil and figure out if balancing for amino acids might be right for your girls and your bottom line.

Article Quick Reference

- The building blocks of protein (called amino acids) are different in different protein sources
- Dairy cow rations are most often deficient or "limiting" in lysine and methionine
- Crude protein content can be lowered if the quality of protein (meaning amino acid content) is matched to cow requirements
- Ration balancing software programs should take amino acids into account
- The total amount of each amino acid consumed by the cow is as important as the 3:1 ratio used to balance methionine:lysine

Watch Out for Alfalfa Snout Beetle

Dr. Eric Young, William H. Miner Agronomist and Researcher

The alfalfa snout beetle (ASB) is the most damaging alfalfa insect pest and can completely destroy an alfalfa stand within a year or two. The Ontario Ministry of Agriculture estimates that ASB can cause a 20 to 30% increase in feed costs in some cases due to reductions in yield and quality, certainly something that no dairy farm can afford.

ASB was identified as an alfalfa pest in the late 1920's when alfalfa was introduced as a forage crop in Oswego County. ASB has since spread

onto an estimated 500,000 acres of NNY cropland. Adults can hitch rides on farm equipment, beehives, and other equipment. All adults are females and it only takes one to start an infestation as they can lay 300 to 1,000 eggs. Recent infestations have been found in Malone, NY and along Lake Champlain north of Plattsburgh. No evidence of ASB has been noted on fields at Miner Institute, but the recent discovery of ASB nearby should have all farms in the area concerned.

The broad host range of ASB (alfalfa, clover, wild carrot,

dandelion) and the inability to manage them with insecticides makes control difficult. The real damage is caused by larvae. Adults are on the move in April and lay eggs in June. Larvae migrate to depths of one to two feet in the soil and feed on roots until they pupate the second year. Damage by ASB should not be confused with winter kill. The best time to look for ASB damage is in the fall, usually in late October.

The picture below showing damage was taken the third

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week of October before 4th cutting and was easily distinguishable from the unaffected portion of the field in the background. ASB is typically found in well drained areas where the seasonally high water table is deeper in the soil.

Dr. Elson Shields at Cornell has shown that biocontrol of ASB may be possible by inoculating soils with entomopathogenic nematodes, which prey specifically on ASB and other soil insects. Nematodes are cultured, added to water, and applied with

sprayers at a rate of 1 billion per acre for a cost of about \$200/acre.

Shields recently demonstrated that nematodes persisted for seven years at one site, while ASB numbers stayed at manageable levels compared to no treatment. Shields also works with Dr. Don Viands at Cornell on developing ASB resistant alfalfa. The Shields lab has screened hundreds of thousands of plants and Viands performs the selection and cross breeding. Shields believes that both alfalfa resistance and biocontrol will be required for effective ASB

control.

If you think you have seen ASB on your farm or have observed suspicious alfalfa damage, please contact me, your crop consultant, or Cooperative Extension for assistance on identification.

Eric Young Contact Info

Eric Young
Miner Institute
P.O. Box 90
Chazy, NY 12921
Phone: 518-846-7121 ext 113
Young@whminer.com



Pictured are the ASB adult (top left) and larva (bottom left); ASB larval damage showing the severing of an alfalfa tap root (top right); and an ASB-affected alfalfa field showing an infested area of the field (light brown foreground area; bottom right).

The In's and Out's of Ag Plastic Recycling

Blake Putman, Ag Plastics Recycling Field Coordinator

The Recycling Ag Plastics Project (RAPP) has begun work in Essex, Clinton and Franklin counties. Farms that wish to participate in the project must save their agriculture plastics as directed by the Best Management Practices established for the project. To obtain a copy of the BMP's and to learn more about how you can be involved please call either your regional representative, your local Cornell Cooperative Extension Office or the RAPP Field Coordinator.

Plastics must be kept relatively clean and dry to be recycled. It should be rolled or folded into pillow sized bundles and stored under cover if possible. Different

plastic types should be separated and chemical containers must be rinsed three times. Plan on saving up roughly 1,000 - 1,200 lbs of plastic to make a full bale.

RAPP Contact Info

Essex County-
Dave Reckahn 518-962-8225

Franklin County-
Chas Miller 518-483-4061

Clinton County-
Steve Mahoney 518-561-4616

RAPP Field Coordinator-
Blake Putman 607-216-7242

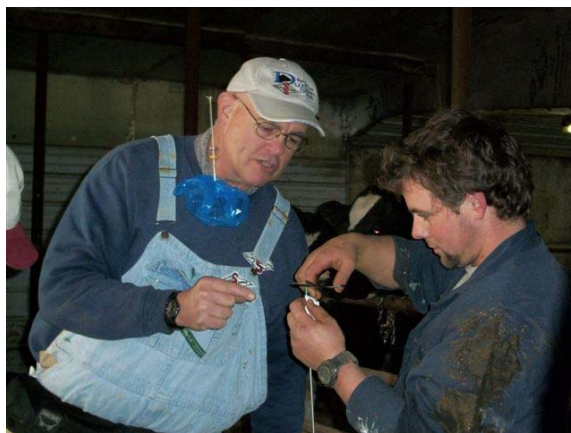


Results of the NNY Dairy Institute Dairy Cattle Repro Class

Emily Myers, Regional Dairy Specialist

The first module of the Northern NY Dairy Institute was completed in Franklin County just before Thanksgiving. This module focused on Dairy Cattle Reproduction and was taught by Iver Johnes of Select Sires. We had nine students of a wide range in age from farms across Franklin County that participated in the class.

Students learned about reproductive hormones responsible for the changes that take place during the



reproductive cycle as well as how to manage cystic cows. Iver also discussed the various synchronization protocols that are commonly used and what each shot does in the cow.

A thorough review of the reproductive tract and the AI procedure prepped students for the hands on portion of the course, which included dissection of pregnant and non-pregnant reproductive tracts and practicing AI in live cows. We opened a pregnant uterus (which contained a bull calf) and discussed how the calf attaches to the uterus. The size of a three month pregnant uterus was quite impressive compared to the non-pregnant versions. After dissection of two non-pregnant tracts we

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discovered one that had a cervix with two openings, an anomaly which may have resulted in the sudden career change of that cow.

The following class involved practicing AI on cows on a host farm. We'd like to thank the Shipman family for use of several of their cull cows for this class. Most students reported that this was their favorite class out of the entire module, leading us to believe that more hands-on classes should be included in



subsequent modules.

When participants were asked what practices they may implement after taking the class,

several responded that they may start to breed some of their own cows, and/or use more

synchronization techniques.

We would like to thank Iver Johnes for taking time out of his very busy schedule to teach these classes. We also appreciate the Select Sires hats!

If you missed the first module of the Dairy Institute, you will have another chance in mid-January!! The next module will be on Herd Health and will include speakers from a variety of different areas of expertise. We will also try to build more hand-on classes into this module, such as dissection of diseased organs and on-farm visits where students can put their skills to practice. See page 7 for the registration form.

Next NNY Dairy Institute Herd Health Class is Coming Up!

Speakers including (but not limited to):

- Dr. Tom Overton** from Cornell University
- Dr. Rick Grant** from Miner Institute
- Dr. Garry Bennett** from Quality Milk Production Services
- Dr. Palmer** from Palmer Veterinary Clinic
- Dr. Pfaff and Dr. Meier** from Cow Care Veterinary Services

will be teaching the next module in the NNY Dairy Institute. We have a really great line-up of industry experts that will spend a solid 3 hrs teaching, giving hands on demonstrations and answering questions about their subject

matter. This module will also include three on-farm sessions where participants can practice the skills they learn and talk to other producers about their management styles.

As with the last module, these classes will take place in both Franklin County at the 911 Services Building on Barrehill Rd. in Malone and also in Clinton County at Miner Institute in Chazy. Farm visits will be within each county. You pick which location best suits you!

This module will consist of seven classes, one per week for seven weeks from 1-4 pm in the afternoon. Classes start January 12th in Clinton and 13th in

Franklin County.

This module of classes is also offered for credit at Alfred State, Morrisville and Cobleskill if desired. Although we hope you can attend all classes, participation is only mandatory for those who want college credit. If you would like to attend but have to leave early, arrive late, or miss a class, let us know and we can work with you!

Class Schedule

Class 1: Management of the close-up dry cow. Preventing fresh cow metabolic disease.

Class 2: Fresh/transition cows, physical exams, diagnosis and

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Northern NY Dairy Institute Herd Health Registration Form

Check which option you prefer: ___ \$75 Certificate of Completion ___ \$150 College Credit

Name _____ Telephone _____

Number that will attend _____

Street _____ Town _____

Zip _____ E-Mail _____

Make checks payable to Cornell Cooperative Extension. Payment can be submitted at the first class or mail to: Emily

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treatment of disease. Benchmarks and SOP's.

Class 3: Calf and heifer health management – how to recognize and treat calf disease. Dehorning with lidocaine.

Class 4: Milk quality and mastitis – Culturing, pathogens, sample collection, treatment and

milking procedures. Mammary gland physiology.

Class 5: Vaccine management. Immunology, why we vaccinate and vaccination SOP's. Why do vaccines fail?

Class 6: Reproductive management – How metritis, BCS loss, and lameness effect reproductive performance.

Benchmarking to determine if these issues need more attention on your farm.

Class 7: Lameness management – Cow comfort, stocking density and welfare as they relate to production and lameness. Benchmarks to detect if lameness is an issue in your herd and how to do lameness scoring.

Do you have questions about the Northern NY Dairy Institute? Please call Emily Myers (518-353-4949) or Carl Tillinghast (518-483-7403) for answers!

Future News/Events

NNYDI Herd Health Classes - Starts Jan 12th in Clinton and 13th in Franklin County. See page 6 for details.

Winter Dairy Management 2010 workshop will be held January 21st at Miner Institute in Chazy, NY. It will run from 10:30-3:00pm, and will include lunch. Registration fee will be approximately \$25.

Topics that will be covered include:

- . Catching mastitis pathogens
- . Foot health
- . Animal welfare audits/assuring herd health
- . Will finish with a Q &A session

Corn Planter Calibration/Kernel Processing Workshop - Will take place in both St. Lawrence and Franklin Counties. Exact dates/times/locations yet to be determined, but will likely be held in mid January.

Farm Labor Class - Taught by Anita Deming and Tom Maloney on Feb 23 rd from 12:30 to 3 pm. The class will take place at Miner Institute and will focus on labor management on dairy farms.

Contact Information: Please call if you have questions or comments about upcoming programming. Also, if you have a question you'd like answered in the Dairy Newsletter, I'd like to hear it!

Emily Myers

P.O. Box 90

Chazy, NY 12921

Cell: 518-353-4949

Email: erm35@cornell.edu



Cornell University
Cooperative Extension
Franklin County

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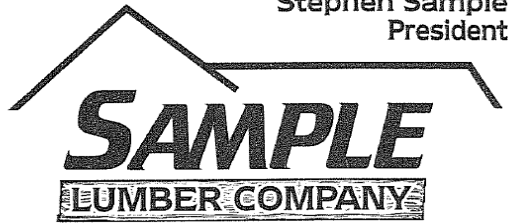
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WWW.YANKEECA.COM

Marie A. Guay
Senior Loan Officer

9784 Route 9 • PO Box 507
Chazy, NY 12921
518/846-7330 Fax 518/846-8010
800/545-8374
marie.guay@yankeeca.com



Stephen Sample
President



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LUMBER COMPANY

53 Campground Rd Phone: 518-236-7788 1248 County RT. 22 Phone: 518-483-7500
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Saranac, NY 12981
Phone: 518-293-8358

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