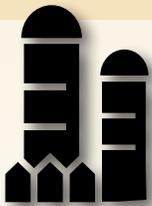


# Rock River Laboratory News

Issue No. 0113



## ***Your silage storage is a bunker of opportunity***

Opportunities lie beyond just traditional silage pile management.

Feed shrink has become a hot topic as dairy and beef margins erode in the current agriculture industry setting. Using research estimates, forage shrink loss per year in harvested U.S. forages is 14%, which corresponds to approximately three billion dollars<sup>1</sup> of feed. Nevertheless, where there are challenges in farming, there is opportunity. The industry looks to management practices to lessen this burden on the growers' and producers' bottom line. Forage preservation management factors are the best way to capture this opportunity, but accurately estimating shrink has proven difficult.

"Ensiling or fermenting forages is an art that many producers learned at a young age – with the aim of feeding out every ton harvested," says Dr. John Goeser, nutrition, research and innovation director at Rock River Laboratory. Fermentation shrink starts in the field, with feed losses happening via physical losses such as leaf shatter and damage.

"However, many people forget that the metabolic process of fermentation also begins in the field," says Goeser. "After legumes or grasses are cut, they continue to live and will utilize

sugars until effectively preserved. Hay that has been rained on or hay that takes longer to dry or cure is extending the sugar breakdown period - which contributes to greater forage shrink."

Goeser further explains that creating silage is no different than making hay in that the faster it is preserved, the better the chance of saving at least 1-3% forage shrink.

### **Deconstructing the art of fermentation**

While quick forage turnaround in the field is important, the greatest shrink actually happens during ensiling and feed out. During ensiling (fermentation), oxygen is removed and bacteria produce acids from sugar, which ultimately lowers forage pH to the point that microbial activity ceases and preservation takes full affect.

"The lack of oxygen slows aerobic yeast from procreating, while the low pH stops mold buildup," says Goeser. He goes on to explain that a perfect fermentation would yield 100% energy conservation and no shrink would occur.

Unfortunately, as many have witnessed more than they'd like, imperfect fermentation, and shrink, happens when acetic acid or other compounds are produced instead of lactic acid. With

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acetic acid, sugars convert to acid but it is not as potent as lactic acid – requiring more of it to lower the pH to the level needed.

Goeser explains the science behind fermentation by outlining the chemical math behind fermentation shrink, with the equation appearing as:  
1 Sugar (6 Carbons) -> 2 Acetic Acid (4 Carbons) + 2 CO<sub>2</sub> (2 carbons: Gas lost as shrink)

“Much like boiling water is dismissed as vapor to nothing tangible, this sugar energy and feed value is converted to carbon dioxide (CO<sub>2</sub>) and then gone. Poof! But without any magic,” describes Goeser. “In this case, two carbons are lost out of the original six, which equates to 33% shrink!”

#### Where opportunities lie

Sound management centers on sound measures. A specific forage management goal for producers should be creating benchmarks, building goals from these, and improving through specific management agents every year and every cut. Goeser points out that new measures exist for fermentation shrink. “Following ensiling, forage dry matter losses can now be predicted through forage and fermentation parameters – opening more opportunities to enhance fermentation management and guide nutritionists and farm managers toward the right management tools to improve.” This new fermentation shrink prediction provides a shrink measurement, expressed as a percentage of the original DM that went into the silo.



Goeser offers a few key opportunities and tips for nutritionists, growers and producers to hone their forage management and reach the goal mentioned, including utilizing this new shrink metric, in working to keep more feed in their silage storage:

- 1. Create a timeline for regular benchmarking.**  
This should include running an initial fermentation shrink analysis<sup>2</sup> at least 2-3 weeks after feed is ensiled.
- 2. Set benchmarks based on running a fermentation analysis.**  
Feed, and shrink, varies. Goeser says that measuring throughout the year will help all parties understand variation within the feed. “Just like forage nutritive analyses, assess feed shrink throughout the preservation and feed out process,” explains Goeser. “If the silage storage isn’t a stable system, more shrink can occur throughout the year.”
- 3. Assess management practices based on how fermentation shrink within the pile, bunker, pit or silo changes throughout this season.**  
Producers and growers should discuss results with their nutritionist and agronomist, reviewing the fermentation changes through each silo feed out, to gather proper, specific management recommendations based on these results.

Goeser stresses, “while management changes have the greatest effect on lessening fermentation shrink, watching shrink variability through the year can help gauge where management tools are working or specific items can be improved for next year’s crop.”

<sup>1</sup>Using \$152 per ton of forage, adapted from Cabrera et al. (2014).

<sup>2</sup>The Fermentation Shrink analysis prediction is based on a statistical model, outlined in the *The Professional Animal Scientist* paper, “Forage fermentation product measures are related to dry matter loss through meta-analysis”, from J.P. Goeser, C.R. Heuer, and P.M. Crump. Fermentation Shrink value is currently only offered by Rock River Laboratory, Inc.



## Corn silage crop trends 2015

By: John Goeser

This year’s corn silage crop across the nation saw a lot of variable weather through the growing season. Ohio was drowned with rain early in the year but dried to drought status in the latter part of the growing season, while California continues to suffer from a multi-year drought. But what effects did this have on the end crop? We’ve analyzed corn silage samples from across the nation and summarized the relevant highlights to identify trends and build rations around the positives and negatives to help balance for optimal performance of the herds with which you work.

#### Carbohydrates are variable.

Silage starch content is up and Neutral Detergent Fiber (NDF) levels are down across much of the Midwest U.S. To the east, the challenging growing season appears to have resulted in average starch levels, similar to the west coast. Ohio corn silage’s NDF Digestibility (NDFD) has increased in 2015, while Illinois and Minnesota showcased a decline in NDFD, as compared to 2014. The drops seen in Illinois and Minnesota could equate to a loss of 3 pounds of milk per cow if the TMR reflects this decrease. Other regions of the U.S. are consistent with the fiber trends we observed in 2014, which were average.

#### Starch digestibility decreased at harvest, but looks to be rapidly improving.

The new 2015 crop of corn silage boasted a substantial decline in starch quality but now

looks to be recovering. For example, rumen starch digestion (RSD, 7h) was around 80% in June and July of 2015, while after converting to the new crop in fall 2015, RSD7 was down to 60 to 70%. This decrease could also account for 3 pounds of milk lost on average if the TMR reflects this decline. More recently however, RSD7 with fermented silages is creeping back to the 75 to 80% average.

**Anti-nutritional factors varied across the crop. Yeast counts on 2015 corn silage are up substantially across the US, except in California.** This could potentially be the result of a less aerobically stable crop. Meanwhile, mold appearance, which can in some cases lead to toxins, is also up in 2015 corn silage. Indiana and California seem to have dodged this trend. Unlike 2014 and early 2015, Vomitoxin doesn’t seem to be an issue in the first few months of feeding out the 2015 corn silage crop.

**Overall, the corn silage crop in particular appears to have more NEL (net energy for lactation),** and steady fiber quality from 2014, coupled with greater starch content and rapidly improving starch quality, all equating to better performance. However, this year’s crop’s preservation and stability are questionable. On another positive note, mold and mycotoxins do not appear to be an issue at this point in 2015. Rock River Laboratory will review this trend again in early spring when such anti-nutritional factors start to ‘wake up’ as all feed storage thaws. Keep an eye on the Rock River Laboratory blog, Twitter feed (@Field\_Updates) and the Rock River Laboratory, Inc. Facebook page for regular updates on crop trends we’re seeing in the field to stay abreast with nutrition-depleting factors on which your herds should keep a proactive pulse.



## Employee Spotlight: Jacob Karlen and Melody Hornback

Rock River Laboratory is proud to announce the hiring of two new employees: Jacob Karlen as Near-Infrared (NIR) Manager, and Melody Hornback as Wet Chemistry Lab Technician.

In Karlen’s new position with Rock River Laboratory he will work to track, manage, and maintain Rock River Laboratory’s extensive network of NIR instruments, both domestic and abroad.

“Jacob’s understanding and enthusiasm for accuracy of instrumentation, science, and NIR spectroscopy is a great benefit to our team and customers,” says Zac Meyer, Rock River Laboratory director of operations.

Karlen, who grew upon his family’s 80-cow dairy farm near Monticello, Wis., earned his Bachelor of Science degree in Biochemistry from the University of Wisconsin, Madison in 2008. During his college career, Karlen worked in various positions for the USDA-ARS-Dairy Forage Research Center (DFRC) as a biological science aid, and entertained an internship with Cargill Dry Corn Ingredients. Karlen returned to the Madison-based DFRC after graduation to expand his involvement with NIR operations and went on to work within the cooperative relationship between the NIRS Forage and Feed Testing Consortium (NIRSC) and DFRC. Currently, Karlen is working to earn a master’s degree in Biological Systems engineering, focusing his master’s research project on portable NIR instrumentation.

Hornback, located at Rock River Laboratory West, will be responsible for wet chemical analysis of feedstuffs at the in Visalia, Cal. facility

“Melody’s agriculture experience and understanding, along with her attention to detail are valuable facets that make her a great fit within our team. Her passion for



Jacob Karlen



Melody Hornback

science and infectious energy is an excellent complement to the customer service that our western facility customers have come to expect,” says Meyer.

Hornback grew up in Cohasset, Cal., where she developed her love of agriculture through her family’s horses and her 4-H market lamb project. Hornback recently earned her Bachelor of Science degree in Animal Science from California State University, Chico. During her college career, Hornback honed her skill set with a clinic assistant role at a local animal shelter and through her work at a veterinary hospital.



# Wisconsin Crop Management Conference

Rock River Laboratory will again be attending and exhibiting at the Wisconsin Crop Management Conference (WCMC) in 2016. Taking place at the Alliant Energy Center in Madison, Wis. January 12-14th, this event offers our team an opportunity to stay abreast with updates in the industry, continuing education classes, networking time to build relationships, and an open forum to showcase Rock River Laboratory's latest tools and services.

Those attending the event are invited to visit Rock River Laboratory at booth numbers 308 and 309. While there, attendees can sign up to win a Weber grill or an expense-paid pheasant hunt with friends at Milford Hills Hunt Club in Milford, Wis. Rock River Laboratory will also be launching a new tool at the event that will make all agronomists lives easier. Come see for yourself and learn more about this exciting new technology!

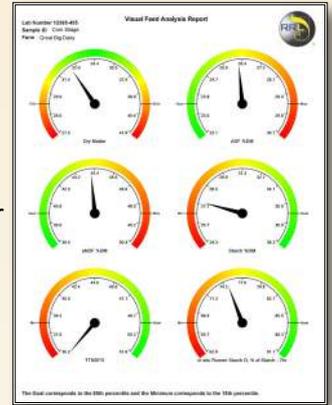
For those who cannot attend the event, you can still keep up to speed on all the latest updates from WCMC on the Rock River Laboratory, Inc. Facebook page and Twitter feed (follow @Field\_Updates).



# Visual reports offer new perspective

Rock River Laboratory has launched new Visual Reports to showcase nutrition laboratory results in graphic format for easily understood quality distinctions of analyte values. The dashboard dial style of the Visual Report format utilizes color coding to help the user easily decipher if a feed component analyzed in the laboratory is characterized as good, bad or needs improvement – based upon four-year averages and standard deviations.

Fully customizable, Visual Reports offer six analyte dials per report, which can be selected from all routine nutritive and digestion measures available from Rock River Laboratory. Report setup is very easy! For more information on how to access Visual Reports, visit the Rock River Laboratory website, [rockriverlab.com](http://rockriverlab.com), or contact our customer service staff by phone at 920-261-0446.



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