

Regulatory Services News

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Feed - Fertilizer - Milk - Seed - Seed Testing - Soil Testing
Ag Lime Testing - Industrial Hemp Testing

Spring 2024

Director's Digest

New Year Thoughts

As I drove in to work this morning my truck thermometer said it was 3 degrees outside and we have about 3" of snow on the ground. This was the first significant snow in Lexington in over a year and more is predicted for later this week. Certainly, a reminder that we are in January and a new year has begun. January brings many predictions of what will come in 2024 which I always catch myself reading. There are many thoughts on what quantities of commodities will be planted this year and what prices they will bring, what ag technologies will become commonplace, the importance of sustainability, and the movement to buy local. I would like to go back at the end of the year and see how many of these predictions have come true but usually forget the predictions by the time spring weather starts affecting what will really happen this year.

Another thing that a new year brings in most states is the beginning of a new legislative year. Due to the news media we often pay attention to what happens in the national legislature but may pay little

attention to what happens in the state legislature. Since taking this job, I've learned how important it is to be aware of what is happening in the state legislature, especially in even numbered years when the biennial budget is decided. If you are involved in farming or agribusiness, laws enacted by the state legislature can have as much or more effect on your business than those passed on a national level.

According to a 2020 survey by the National Conference of State Legislatures (NCSL), only 4.6% of state legislators work in agriculture, which is half of what it was in 1976. It's important that legislators know what is important to you. We have many agriculture groups that lobby for us such as Kentucky Farm Bureau, Agribusiness Association of Kentucky, and commodity groups such as the Kentucky Cattlemen's Association. At the very least, get involved with these groups and let them know what is important to you. Most of them will provide legislative bulletins to their members on what they are working on with the legislature. Preferably, learn who your legislators are and do not hesitate to contact them about issues concerning you. You can go

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to the following website and find out who your legislators are, what bills are being considered, and can even email your legislators from this site: [Welcome - Legislative Research Commission \(ky.gov\)](https://www.lrc.ky.gov/).

I recently read about a program carried out by the Illinois Farm Bureau that I really like since so few legislators are connected to agriculture. The program is entitled “Adopt-A-Legislator” and connects county farm bureau leaders with state legislators. As of last February, 75 legislators had been adopted with most of them being in Cook County (Chicago). According to an Illinois Farm Bureau representative, “Adopt-A-Legislator is one of the best tools we have to reach out to Chicago legislators and develop relationships.” This is a two-way relationship. By building relationships with urban lawmakers, farmers and county Farm Bureau leaders come to be viewed as information resources for legislators who ask questions about farming or how a bill might impact agriculture. Legislators may be invited to visit the downstate county and receive hands-on experiences such as riding in farm machinery, feeding animals and life on a farm. These farm bureau leaders in turn, visit their legislators district and learn about important urban issues and help with development of urban agriculture. This is a great program to improve communications between rural and urban interests.

The old saying of “an ounce of prevention is better than a gallon of cure” was never more true than when dealing with potential laws and regulations. It’s easier to get legislation correct before it is passed than after. I encourage you to make the effort in 2024 to pay attention to what’s happening in your state legislature and be willing to let your legislators know how a potential piece of legislation may affect your business.

Darrell D. Johnson,
Executive Director

**COMMERCIAL FERTILIZER
VALUES FOR 2024**

Commercial fertilizer values are determined and published each year. A state-wide survey was conducted in December 2023 to determine the averages for 2024. Under the provisions of Chapter 250.401 of the Kentucky Fertilizer Law, the following unit values are announced for use in determining and assessing penalties of deficient fertilizer. They represent the average of responses from throughout the state for retail value of bulk mixed fertilizers. The value of Nitrogen, Phosphate and Potash decreased since the survey conducted last year, the current values are listed below.

A few examples of common mix values per ton are:

9-23-30	\$637.46
19-19-19	\$624.15
10-10-10	\$328.50
5-10-15 low Cl	\$449.30

Values for each nutrient are shown in the table on page 4.

Continued on page 4

NUTRIENT	DOLLARS/UNIT (20 LBS.)	DOLLARS/UNIT (1 LB)
Total Nitrogen (N)	\$12.86	\$0.64
Avail. Phosphate (P ₂ O ₅)	\$11.14	\$0.58
Soluble Potash (K ₂ O)		
*Tobacco (low Cl)	\$18.24	\$0.91
*Non-Tobacco	\$8.85	\$0.58
Calcium (Ca)	\$7.64	\$0.38
Magnesium (Mg)	\$43.67	\$2.18
Sulfur (S)	\$11.53	\$0.58
Boron (B)	\$144.30	\$7.22
Copper (Cu)	\$168.57	\$8.43
Iron (Fe)	\$10.80	\$0.54
Manganese (Mn)	\$29.36	\$1.47
Molybdenum (Mo)	\$20.20	\$1.01
Zinc (Zn)	\$63.43	\$3.17

Calculation Note:

The N value for DAP & MAP was assigned from anhydrous ammonia (AA).

The value of P from DAP and MAP was calculated using the assigned value of N from AA.

The final values for N and P are weighted averages based on FY 2023 (distributed) tonnage for ammonium nitrate, Urea, DAP, TSP, MAP, and ammonium sulfate.

If you have any questions, please call me at (859)-257-2785; or, email: smcmurry@uky.edu

Stephen McMurry,
Director Fertilizer and Seed Programs

Understanding Nutrient Composition in Common Kentucky Feed Ingredients

In 2020, I reviewed sampling data from a 3-year period (2017-2019) for the most commonly sampled ingredients in Kentucky: corn, corn gluten feed, distillers dried grains, soy hulls, and soybean meal. At the time, I focused entirely on crude protein. This review includes additional sample results with data from 2016 through 2023.

I pulled these data from a database of ingredient samples used as the basis for composition values for our feed calculator spreadsheet. The current database contains a total of 2617 samples of which 2497

were collected under official methods. The other 120 samples were not collected under official methods – primarily research and service samples – but can still be of value for composition estimation purposes. For this review of our top five commodities, I included only official samples with wet chemistry determination of crude protein, crude fat, and crude fiber and we had a total of 2081 samples. Since late 2020, we have used Near Infrared Spectroscopy (NIR) to estimate composition of both mixed feeds and ingredients. NIR has been a valuable tool in quickly determining protein, fat, and fiber components but we do exclude NIR data from this calculator database.

Table 1 (page 6) shows the average crude protein guaranteed for each of the 5 commodities by sampling year. Table 2 (page 6) shows the average crude protein found in these samples.

Corn. Of the five ingredients, corn is the only one where guarantees are not always required. The average guarantee for crude protein in corn would include only processed corn – ground, cracked, rolled, or flaked. Processed corn is typically guaranteed at between 6.5 to 7.0% crude protein. Our results for all corn sampled (processed and whole corn) show an average of around 7% crude protein over the last 8 years. For formulation purposes, I would recommend a crude protein level of 7%. With new corn in the fall and higher moisture levels, a formulator may want to consider dropping a crude protein level of 6.5% for a few months.

Corn gluten feed. Our samples averaged about 20% crude protein over the time period covered. With average crude protein guarantee of 17%, corn gluten feed will consistently hit its protein guarantee. For formulation purposes, I would recommend a crude protein level of 19.5% for this ingredient. Formulating at a lower protein level for corn gluten feed will certainly provide some flexibility in meeting the protein guarantee for a mixed feed. However, I would not lower the formulation protein to the minimum guarantee level. You will see a name change with this ingredient in the next few years. The new name will be corn protein feed.

Soy hulls. Like corn gluten feed, soy hulls are typically guaranteed below the average crude protein level we find in our samples. Our soy hulls samples averaged 10% crude protein found and 9% crude protein guaranteed. For formulation purposes, I would recommend a crude protein level of 9.5%.

Dehulled soybean meal. Our samples averaged about 47% crude protein over the 8 year period, right at the label guaranteed minimum. However, we have

found a downward trend in protein in the last 4 years. In 2023, the average crude protein was the lowest in the last 8 years at 45.8% and 29% of 56 samples were declared deficient in protein. We have noticed more dehulled soybean meal labeled at 46 and 46.5% minimum protein in the last few years. A formulation value of no more than 46% would be recommended.

Distillers dried grains. I'll discuss this ingredient last given the differences in products available in our market. The majority of DDG products in our market come from beverage production with around 75-80% of all DDG sampled. When firms label DDG and become the guarantor, we do not usually know the source of the product. However, if you compare what we know is sourced from beverage production to those unknown source products, it is clear they are most likely from our beverage distilleries (Table 3). A beverage distillery guarantee of 25% crude protein is common and a reasonable value for a formulation program. If the DDG is from an ethanol plant, 27-28% protein could be used in formulation. In the last few years, we've also found DDG from MGPI in Lawrenceburg, IN and this product will have a lower protein concentration and a lower guarantee due to the difference in this firm's beverage products. Bottom line with DDG is know your source and use appropriate formulation values.

Keeping our ingredient database up to date allows us to put market-appropriate formulation values in our calculator and provide useful data to KY manufacturers. Though the majority of our ingredient sampling and analysis focuses on our five major ingredients, we have many other ingredients in our database. These are included in our calculation program. If you have questions regarding our calculator or need assistance with ingredient analyses, please contact your local inspector or myself.

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Table 1. Crude protein % guaranteed in UKDRS official samples by year									
	2016	2017	2018	2019	2020	2021	2022	2023	
Corn	6.7	6.5	6.5	6.4	6.6	6.7	6.7	6.9	
Corn gluten feed	17.1	17.0	16.9	17.5	17.0	16.8	16.8	16.9	
Distillers dried grains	25.0	24.3	24.6	24.5	24.5	23.4	23.4	23.8	
Soy hulls	9.0	9.1	8.9	9.1	9.1	9.0	9.0	9.0	
Soybean meal dehull	47.1	47.1	47.1	46.9	47.0	46.8	46.6	46.9	

Table 2. Crude protein % found in UKDRS official samples by year									
	2016	2017	2018	2019	2020	2021	2022	2023	
Corn	7.0	6.9	6.8	6.8	7.1	7.0	7.2	7.1	
Corn gluten feed	20.0	20.5	19.9	20.0	19.0	20.7	19.2	20.5	
Distillers dried grains	25.8	26.2	25.9	26.4	26.2	24.2	24.7	25.0	
Soy hulls	10.0	10.9	9.7	9.4	9.5	11.6	9.8	9.5	
Soybean meal dehull	47.3	48.0	46.4	46.9	47.1	46.9	46.2	45.8	

Table 3. Distillers grains composition (%) by product type									
- UKDRS official samples 2023									
		Crude protein		Crude fat		Crude fiber			
Distillers Grains - Beverage		25.4		6.6		7.2			
Distillers Grains - Ethanol		25.3		5.5		8.2			
Distillers Grains - Unknown		25.3		5.5		8.2			
Distillers Grains - MGPI		22.4		5.3		6.7			

G. Alan Harrison,
Director Feed and Milk Programs

Inspector News

This has been a productive year for the inspection staff as they were able to collect more feed and fertilizer samples than in the previous two years. This year was the first time in three years that we were fully staffed with no retirements and no vacancies.

In the past two years we have had all eight inspectors and I get audited by FDA to continue to conduct the FDA inspections. Our FDA audits are on a three-year rotation with each inspector completing two FDA inspection audits during the three year period. FDA inspections started in November and should be mostly finished by the end of February. Alysia Conner and Daryl Derosssett, our two newest inspectors have just completed all the FDA courses to be able to conduct each type of FDA inspection.

When FDA added the part 507 cGMP and the Preventative Control inspections in combination with the medicated part 225 inspections a few years ago, our division decided to start conducting the inspections with two inspectors and that has been helpful in completing them more effectively.

Here is a breakdown in the feed, fertilizer, seed, and lime program results for 2023. The inspectors sampled 3,332 feed products this past year during a total of 1,012 visits. This includes pet food, livestock feed and feed ingredients. In addition, we conducted FDA inspections at 32 feed mills. For the fertilizer program there were 2,619 samples collected during 982 visits. These included bin material, custom mixed fertilizers, bagged fertilizers, and liquid fertilizers. There were 1,464 seed samples collected during 779 visits including agricultural seed,

lawn seed, vegetable seed, and some specialty seed. The inspectors collected 138 lime samples from lime quarries across the state. Each lime quarry is sampled in the spring and the fall.

Spring is just around the corner and as you get seed and fertilizer products delivered to your facilities, if there are any products you want tested, please contact your inspector, and let them know and they will collect a sample for you. Don't forget to go through your inventory of held over seed to make sure labels are current and up to date for spring planting season.

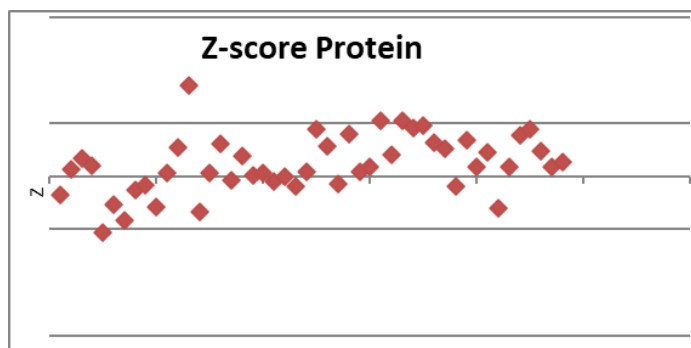
Jim True,
Inspector Program Coordinator

What Does Quality Mean At Regulatory Services?

Quality can mean different things for different people. For us at Regulatory Services, it means that all steps of processing samples—from the time an inspector takes it, until the analytical results are reported out to the dealers, manufacturers, and farmers—follow certain procedures so that the analytical values found are unbiased and accurate. There are several tools in our toolbox to make sure that this happens. One of the tools is using validated methods to take, split, and analyze the samples. Some may wonder what is so important to use “validated” methods. It is important to use such methods because they are typically the final version that many laboratories used in what is called a collaborative study. In a collaborative study, a large number of laboratories use the same method to analyze a certain property (e.g. protein, calcium, fiber, etc.) in many different types of samples (e.g. poultry feed, premix, dry dog food, etc.). The results then undergo strict statistical analysis protocol to determine if the method is the correct one for the specific property for the specific sample type. Our inspectors follow validated methods when taking feed and fertilizer samples. And once the sample arrives at the laboratory, validated methods are used in splitting, grinding, digesting, extracting, and analyzing the property of the sample. This is only the first step of ensuring that the analyti-

cal result is unbiased and accurate.

So, we have taken the sample correctly and are using a validated method when analyzing the sample, how do we know that our results are unbiased and accurate? In order to monitor our laboratory performance, we participate in proficiency testing programs. There is one main program for feed and feed ingredients with 2 additional add-on programs and there are 4 programs that utilize fertilizer and fertilizer ingredients that we participate in. Once we have analyzed the properties of the sample from the program, we report the answers and the methods that we used. All results that are reported by all the participants in the programs are statistically analyzed. Once the math has been performed, we can then compare our value to the participants' average, called the consensus value, by using the all of the participants' standard deviation. It sounds complicated, and the statistics involved are, but by charting our results based on the consensus value and method standard deviation, we can easily evaluate our lab performance. This chart is called a control chart and it is monitored to look for trends so that bias and accuracy can be observed. Let's look at the chart below.



This is our charted results for a common property of feed, protein, over a span of 4 years. It is a good example of our laboratory performance because it shows that our results as compared to the rest of the participants' performance for protein are very tightly centered on the consensus value with no apparent bias. Each property that we analyze has its own chart that is monitored and evaluated. So, now we have two tools in our tool box monitoring the quality in our laboratory results. What's next?

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Another valuable tool we use to ensure quality results is by including quality check samples in each set of analysis. Let's think about a mineral premix. In a mineral premix certain minerals are guaranteed to be present in certain concentrations. If we want to make sure that when we analyze this sample that we have a high degree of accuracy and no bias, we will include quality check samples that have the minerals present near to the guarantees of the minerals in the sample. This quality check sample will be treated as a regular sample as it will be weighed out, digested, and analyzed in the same way as regular samples. An example of a quality check sample is a proficiency sample from one of the programs we participate in or perhaps a reference material from another known and reliable source such as the National Institute of Standards and Technology. The results from each time it is analyzed is compared to its consensus or certified value and monitored to make sure that each set of samples were digested and analyzed both accurately and unbiased. Another type of quality check is our instrument calibration verification checks. We analyze all of our minerals via ICP-OES (Inductively Coupled Plasma-Optical Emission Spectroscopy) which means we are measuring the strength of each mineral at certain wavelengths. How do we know that each wavelength is calibrated correctly? We use a purchased standard that contains all of the minerals and are certified to be present at a certain concentration within a certain precision. This is monitored over time as well to ensure accurate and unbiased analytical results.

By using validated methods, participating in proficiency check sample programs, and by including quality reference materials in our analyses, we monitor the precision, accuracy, and bias of each analyte. This makes sure that when we report analytical values for an Official Feed or Fertilizer Sample that has been taken by one of our highly trained inspectors, that our findings are accurate and unbiased. We are continually looking for ways to improve our quality standards. This is why we are heavily involved in organizations at the regional, state, national, and in some cases international levels. It is im-

portant to keep on top of new strategies of collecting and analyzing samples. We take a leadership role at the national level so that quality standards are upheld and improved upon. We will continue to improve so that our consumers, stakeholders, and farmers are protected. We currently follow the Association of American Feed Control Officials' Quality Assurance/Quality Control Guidelines for State Feed Laboratories 2007 and will be improving upon these standards.

*Sharon F. Webb, Ph.D.
Director, Quality Control*

Upcoming Events

Association of American Plant Food Control Officials (AAPFCO) Winter Meeting

February 18-20, 2023

Renaissance Mobile Riverview Plaza Hotel

Mobile, AL

[AAPFCO Meetings](#)

Kentucky Dairy Partners Annual Meeting

February 27 and 28

Sloan Convention Center

Bowling Green, KY



Bruce Combs wins 2023 Poundstone Award

Bruce Combs was awarded the 2023 Poundstone Award. Bruce has worked at Regulatory Services in two stints. Bruce started as a Laboratory Technician Senior in October of 1994 and moved to the ICP (mineral analysis) lab in 1997. He left in May of 2001 to work in another campus department but came back to our ICP lab in January of 2013 where he is still today.

His dedication to our Division and positive attitude is best described by his nominator: *“Bruce has always been timely in submitting data and effectively communicates when there are problems. Well, that is what his job requires. What his job does not require, is for him to check with his supervisor on his availability when he is finished with his regular work but he chooses to anyway, every single time. Bruce also stays late when situations demand and always has a great attitude about it. Perhaps my greatest motivation to nominate Bruce is his friendliness towards all people. He always brings very positive energy to the building no matter the personal challenges he may be going through.”*

Congratulations to Bruce and we appreciate all you bring to our Division.

History of the Poundstone Award

The Poundstone Award was created to honor an outstanding employee in the Division of Regulatory Services. The award is named in honor of Bruce Poundstone, who was Director of Regulatory Services for many years. He was nationally renowned for his leadership and innovations in the feed, fertilizer, and seed regulatory arena. He was founder of the Feed Microscopy Association, started the AAFCO Feed Control Seminar, and was a participant in the development of the GMP concept for feed manufacturing. Mr. Poundstone was a distinguished leader in the Association of American Feed Control Officials, the Association of American Plant Food Control Officials and the Association of Southern Feed, Fertilizer and Pesticide Control Officials. The Regulatory Services building is named in his honor.

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