

Regulatory Services News

Vol. 65, No. 3

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

Fall 2022

Director's Digest

Keys to Consumer Acceptance of Ag Technology

The Center for Food Integrity (CFI) with support from the United Soybean Board released a study last fall identifying keys to consumer acceptance of technology. "Agriculture has a rich history of innovation," said Charlie Arnot, CFI CEO. "As farming and food production practices integrate more technology, it's increasingly important of those in agriculture to understand the keys to successfully build support for technology so they can continue to make progress."

CFI measured consumer attitudes regarding four agriculture and food technologies to identify the drivers of consumer acceptance and rejection of technology. The technologies used as prompts in this study included gene editing in plants, gene editing in animals, plant-based meat and cultured (cell-based) meat.

The study found key drivers for acceptance of technology include:

- Belief that food resulting from technology use is safe to consume
- Information on food produced through technology

is readily available, enabling an informed choice of voluntary exposure.

- Benefits outweigh perceived risks
- Technology can help ensure a consistent supply of food
- Technology promotes greater sustainability by making more with a lesser environmental impact

"Consumers are concerned about the direct impact on them such as, 'is the food I'm consuming safe and healthy?'" said Arnot. "That's why there's greater concern about technology like pesticides and gene editing, compared to drone technology or GPS systems."

The research also showed that consumers trust in the organizations that approve and monitor the impact of technologies, and they prefer third-party, independent oversight, along with information from that third-party source. Acceptance of ag technology is dependent on the benefits of the technology outweighing the perceived risk of consuming the end-product.

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“This study shows acceptance of ag technology is highly dependent on the tangible nature of the technology output,” said Arnot. “In other words, ingredients are not as ‘visible’ to consumers, while end products like meat sold in restaurants or grocery stores are very visible. The more tangible the product and perceived impact, the greater the need to deploy a strategic approach to earn acceptance.”

While the research showed that only one in ten consumers felt they knew a lot about the use of technology to grow food in the U.S., nearly two-thirds have a very positive or somewhat positive impression of the use of technology.

“That points to a tremendous opportunity for those in agriculture and food to keep that momentum going and engage on the many benefits of innovation in producing safe, nutritious food to meet the needs of consumers and protect our planet,” Arnot said.

To me, this study was encouraging because it demonstrated that consumers will accept new technologies if they are shown to be safe and beneficial. We must be transparent and remember that they don’t care what you know until they know that you care.

Despite what some would have you believe, the majority of farms are family owned

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We often hear references to “Big Ag” or “Corporate Agriculture” implying that most of agriculture is carried out by big corporations. The USDA released a report at the end of 2021 entitled “America’s Diverse Family Farms-2021 Edition.” This report shows that while farms are getting larger, the vast majority are still family owned. The full report is thirty pages long and is a wealth of information on types of farms, farm financial performance, farm operating expenses, farm payments and even effects of the Coronavirus pandemic on direct sales of farm products. I will be sharing a small part of the information on farm ownership but if you would like to read the full report it is availa-

ble at [USDA ERS - America's Diverse Family Farms: 2021 Edition](#).

For this report, farms are broken into four categories which is largely determined by their gross cash farm income (CGFI). These categories are small family farms (CGFI less than \$350,000), midsize family farms (CGFI between \$350,000 and \$999,999), large-scale family farms (CGFI of \$1,000,000 or more), and nonfamily farms. Non-family farms are those where the principal operator and people related to the principal operator do not own a majority of the business.

Most U.S. farms are small family farms; these farms operate almost half of U.S. farmland and account for 20 percent of production.

- In 2020, approximately 89 percent of all farms were small family farms. Compared with 2011, the share of land operated by small family farms fell from 52 to 48 percent, and the share of the value of production on small family farms declined from 26 to 20 percent.
- Large-scale family farms accounted for 46 percent of the total value of production in 2020, an increase from 35 percent in 2011. These farms also accounted for an increased share of total land operated, up from 16 percent in 2011 to 24 percent in 2020.
- In total, family farms accounted for about **98 percent** of total farms and 87 percent of total production in 2020.
- Nonfamily farms accounted for the remaining 2 percent of farms and 13 percent of production. Among nonfamily farms, 18 percent had a GCFI of \$1 million or more. Such farms accounted for 90 percent of nonfamily farms’ production.

Small farms were broken into categories that I found interesting.

- ♦ **Retirement farms:** Small farms whose principal operators report having retired from farming, though continuing to farm on a small scale (219,288 farms; 10.9 percent of U.S. farms in 2020)

Director's Digest, continued

- ♦ **Off-farm-occupation farms:** Small farms whose principal operators report a primary occupation other than farming (779,767 farms; 38.8 percent of U.S. farms).
- ♦ **Farming-occupation farms:** Small farms whose principal operators report farming as their primary occupation. Farming occupation farms are further sorted into two classes:
 - ◊ **Low-sales:** Farms with GCFI less than \$150,000 (683,514 farms; 34.0 percent of U.S. farms).
 - ◊ **Moderate sales:** Farms with GCFI between \$150,000 and \$349,999 (110,865 farms; 5.5 percent of U.S. farms)

Farmers and ranchers make up 1.3% of the U.S. employed population. The number of farms has dropped from near seven million in 1935 to about 2 million today but farming is still a family business. The productivity of the American farmer never ceases to amaze me.

*Dr. Darrell D. Johnson,
Executive Director*

Can I save seed off the farm?

Each year we get several phone calls on whether a grower can save wheat seed for their own planting with the goal of saving on their input costs. The answer is a little more complicated than just an outright “Yes”. Certain varieties can be saved legally while others cannot. Some varieties are protected with a Plant Variety Protection (PVP) certificate or a US patent. If a variety is protected by a US patent the seed cannot be saved. A PVP variety can be saved, but only the amount that the grower can utilize on their own planted acres. The US patent and PVP protected varieties cannot be sold by the grower as seed. When seed is initially purchased, the label will usually specify if it is PVP or patented.

Some varieties are not protected and these can be saved, planted or sold and not be in violation of any federal or state laws. Requirements of state seed laws must be adhered to when seed is offered

for sale. This includes advertisements in local papers, internet, or signs on the side of the road indicating that seed is for sale. In Kentucky, a permit to label agricultural seed is needed if you tag the seed yourself, or official seed tags can be purchased from our Division for labeling of seed intended for sale. The permit to label allows the permit holder to create their own seed labels and submit a Semi-Annual report of seed sales based on the number and weight of the packages sold.

Seed which is saved for planting purposes should be properly cleaned and tested to make sure the quality you desire is present in the lot. Seed intended to be sold requires a laboratory test to determine the seed purity, germination and noxious weed content of the lot being sold. Some lots may contain noxious weeds or a low germination which may not meet the standards to be sold. All containers and seed sold in bulk must be labeled according to this test. The seed analysis tag is a guarantee to the purchaser of the content of the seed lot so please be aware of the liabilities of selling seed. If you need more information, please contact Stephen McMurry at smcmurry@uky.edu.

*Stephen McMurry,
Director Fertilizer and Seed Programs*

UKDRS Feed Sampling – A 3 Year Review

In 2019, I summarized feed sample data from 2016 through 2018 and decided to repeat the process with our latest samples. This article combines 3 years of sampling data (2019-21) and will focus on different types of products and how well they met their guarantees. I will also touch on individual nutrient guarantees (analytes) and differences between feed types.

Consumers purchasing any type of animal feed have the expectation that the product described by the label is the product they purchased. The label is usually the consumer's only guide to what is in the bulk truck, bag, or other package. This is particularly true with purchasers of pet food.

Our regulations specifically address this in 12 KAR 2:02 – **“The guaranteed analyses that appear upon the label of a commercial feed shall adequately inform the consumer of the actual**

nutrient content of a product. The Division of Regulatory Services shall use the 2018 Table of Kentucky Analytical Variations to determine those analytes that fall outside of acceptable ranges.” Our law and regulations give this division the authority to determine if the consumer is truly adequately informed with regard to nutrient content. We make these determinations based on the table of analytical variations mentioned above. Bottom line, when we analyze a sample, we can assign a maximum allowed value to a label minimum and a minimum allowed value to a label maximum.

Table 1 shows the 8,484 samples in this review broken down by 3 major categories. Similar to what we found in the 2016-19 data, about half of our samples were livestock feed (49.1%), ingredients made up 9.2% of samples, and the remainder of the samples were categorized as pet food (41.7%). Percentage of samples passing (no violations) was highest for ingredients and lowest for livestock feed while percentage of analytes passed was lowest for pet food. Again, these results match our previous 3-year review.

Tables 2, 3, and 4 further break down the samples by intended species. In Table 2, we see that the three largest feed types sampled were beef, poultry and equine feed. The percentage of samples passing ranges from a low of 55.4% to a high of 80.6%. All stock feeds do not have their own category but are grouped with either beef or equine feed. Mineral feeds cross all livestock categories but the majority of these samples are intended for beef animals in Kentucky. The other livestock feed category includes milk replacer, commercial fish feed, and wild bird food. For this review, I included data for the growing category of deer products and this was the category with the lowest percentage of samples and analytes passing.

The most common violation for livestock feed was low crude protein with 13.3% of samples failing to meet the minimum guarantee (Table 5). Poultry, beef, dairy, swine, and deer feed all had crude protein failure rates of over 15%. As we found 3 years ago, manufacturers do a better job with equine feed with only 6.8% not meeting protein guarantees and a better passing rate for both samples and analytes. Medicated feed is not separated into its own category but of the 370 samples containing medication, 87% met their guarantees for the drug added. In the 2016-19 review, we reported a similar passing rate on medicated samples but the number sampled during that period was nearly double at 722 samples.

Ingredients sampled are shown in Table 3. Corn products include both corn, hominy, and corn gluten feed, distillers products are primarily distillers dried grains, and soybean products include mostly soybean meal but also soy hulls. Other includes any other grain products, protein sources, and some fat or mineral sources. It is important to note that because this review only includes samples with label guarantees collected under official methods by our inspectors, the corn products category only includes a portion of all corn samples analyzed by our lab. Corn, distillers, and soybean products comprise more than 75% of our total ingredient samples. Sample passing rates were best for soybean products and lowest for distillers products. Failure to meet the crude protein minimum was the most common reason ingredients did not pass.

Table 4 deals with pet food samples in four categories – dog food, cat food, dog & cat treats, and specialty foods (any pet other than a dog or cat). Most dog and cat foods would be complete foods where we use nutrient profiles (guarantees) established by the Association of American Feed Control Officials (AAFCO). As was the case with our previous data review, cat food is more likely than dog food to meet all its guarantees. The AAFCO mineral profiles for cat food are also less restrictive than those for dog food. It is important to note that 81% of dog and cat food do meet all their guarantees and this is above our overall average. When a dog or cat food failed to meet guarantees, the most common violation was fat and more likely to be excessive than deficient.

Dog and cat treats passed only 70.7% of the time (down from 75.2% in the previous 3 years) and along with deer feed, were the only categories where the analyte pass rate was less than 90%. By far, the most common problem with treats is meeting the fat guarantee with around 1 in 4 samples failing. The vast majority were excessive in fat despite our regulations allowing 5 percentage points over the fat minimum guarantee.

When labeling for any feed product fails to adequately inform the consumer of the actual nutrient content of the product, we have no choice but to consider these mislabeled and request that the guarantor change their formulation or their labeling. It is encouraging that when we compare the data from the most recent 3-year period to the previous data, we can see improvements in sample label compliance across all types of feed sampled.

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Feed Summary, continued

Table 1. UKDRS Sample Summary: By Feed Category
Official samples with guarantees 2019-21

	Total # sam- ples	Samples passed	Analytes per sample	Analytes passed
All Feed Sampled	8484	75.8%	7.0	95.4%
Livestock Feed	4165	72.6%	7.3	94.8%
Ingredients	777	86.6%	2.6	94.3%
Pet Food	3542	77.2%	7.7	96.1%

Table 2. UKDRS Sample Summary: Livestock Feed by Type
Official samples with guarantees 2019-21

	Total # sam- ples	Samples passed	Analytes per sample	Analytes passed
Poultry Feed	746	75.7%	5.1	93.9%
Beef Feed	1250	67.7%	7.2	93.7%
Dairy Feed	85	63.5%	7.4	92.8%
Swine Feed	289	70.2%	6.1	93.9%
Sheep Feed	64	68.8%	7.0	93.8%
Goat Feed	130	76.2%	8.6	96.0%
Equine Feed	736	80.6%	9.3	97.3%
Mineral Feeds	532	75.0%	9.9	95.9%
Deer Products	101	55.4%	6.8	86.8%
Other Livestock Feed	232	70.3%	4.2	92.4%

Table 3. UKDRS Sample Summary: Ingredient by Type
Official samples with guarantees 2019-21

	Total # sam- ples	Samples passed	Analytes per sample	Ana- lytes passed
Corn Products	165	84.2%	2.1	91.9%
Distillers Products	148	77.0%	3.2	92.8%
Soybean Products	283	89.8%	2.3	95.0%
Other Ingredients	181	91.7%	2.8	96.2%

Table 4. UKDRS Sample Summary: Pet Food by Type**Official samples with guarantees 2019-21**

	Total # samples	Samples passed	Analytes per sam- ple	Analytes passed
Dog Food	1265	75.7%	12.1	96.9%
Cat Food	672	92.3%	11.5	99.3%
Dog/Cat Treats	1362	70.7%	2.5	86.0%
Specialty Food	243	79.8%	3.4	93.2%

Table 5. UKDRS Sample Summary: % Analytes Passing By Feed Category**Official samples with guarantees 2019-21**

	Crude Protein	Crude Fat	Fiber (crude, ADF, NDF)	Minerals	Other
Livestock Feed	86.7%	95.3%	98.0%	95.8%	92.9%
Ingredients	90.4%	94.6%	97.7%	94.7%	99.1%
Pet Food	93.5%	86.8%	100.0%	98.2%	95.4%

**Dr. G. Alan Harrison,
Director of Feed and Milk Programs**

Kentucky Hemp in Livestock and Pet Food

Hemp production was a major part of Kentucky agriculture through the 19th and 20th centuries. Kentucky produced the majority of our nation's hemp fiber until production declined and tobacco production grew after World War 1. Industrial hemp production all but halted in 1970 when federal War on Drugs policies included hemp on the Schedule 1 controlled substances list. Industrial hemp production in Kentucky resumed in 2018 with passage of the Farm Bill, and by 2020, Kentucky growers reported growing 5,000 acres of hemp.

The rise in hemp production coincides with a rise in the availability of hemp by-products such as hemp seed meal, hemp hulls and hemp oil. Growers are understandably interested in making full use of their crop by funneling these by-products to animal feed. Despite interest of producers and the hemp in-

dustry, there are currently no hemp ingredients authorized for use in livestock or pet foods. The regulatory pathways for new animal feed approvals require a substantial amount of data to support the safe use of that ingredient in animal feeds. This safety data includes consideration of human foods (meat, milk, eggs) that come from animals consuming the new ingredient.

While it may be confusing to walk down the grocery store aisle and see hemp seeds and hemp oil already available for human consumption, it is important to remember that humans and animals are different. It is also important to recognize that humans have daily agency to choose what they eat, whereas most animals are fed a singular diet for an extended period. Data is required to ensure that new hemp ingredients are safe and nutritious for the animals consuming them.

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Hemp in Feed, continued

There has been progress on gathering this data by the industry and academic researchers. The Association of Feed Control Officials (AAFCO) and the National Industrial Hemp Council of America (NIHC) are hosting a webinar August 9th, 11am CT to discuss the challenges in gaining approval for new hemp ingredients in animal feeds (see flyer at the end of this newsletter). Registration is open to everyone:

<https://www.aafco.org/Meetings/Trainings/2022-Hemp>. Additional information regarding the status of hemp ingredients in animal feed is available in the Joint Open Letter of Concern over the Allowance of Hemp in Animal Feed from February 9, 2022: <https://www.aafco.org/Home/hempinanimalfeed>.

***Kristen Green,
Registration Specialist***

What Quality Assurance Means to Us

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. Although we have discussed this before, I think it is something we should revisit every so often so that we are proactive in how we analyze a sample and report out results. As you are aware we are accredited to the ISO/IEC 17025:2017 standard. There are several reasons for a laboratory to do this. One reason is for the laboratory to show that they are competent and generate valid results. Being ISO/IEC 17025:2017 accredited promotes confidence in the analyses and methods they perform. Another reason is because the accreditation makes it easier for cooperation between laboratories and other governments. If you think about this on a global scale, it may aid in improving international trade if the test reports and certificates can be accepted from one country to another.

The real benefits from operating a quality system begin after the accreditation process. As we

perform internal audits of our method standard operating procedures and annual audits of our quality management system, we may uncover issues that need to be improved upon. This is where having a method in which to control documents benefits everyone. It makes training someone performing a method easier. It gives the analyst a way to implement and complete needed changes or improvements. We have to be very precise in our record-keeping and pay very close attention to details of each record. Operating within a quality system is beneficial to the analysts, program directors, and the reputation of our division. Every year we send our customers a survey to see our laboratories' performance from their point of view, to better understand what their needs are, if their needs are being met, and to improve things in the laboratory to their benefit. Implementation of ISO/IEC 17025:2017 provides a system for continuous improvement of daily laboratory practices.

When we perform internal audits of our chemical and/or microbiological methods and records, we review all records for pieces of the equipment used in the method. Sometimes they may reveal that there is something wrong with the equipment and we can have it repaired and/or replaced. Each method is audited annually. During the audit we verify personnel competency training, the validity of the method and if it has been updated, accommodations are still adequate, environmental conditions are acceptable for the method requirements, go through the control charts & evaluate performance, review the verification/validation packet, and recalculate the measurement uncertainty. We also review the reagent logs for traceability. Depending on the number of analytes in the method, how many pieces of equipment, and proficiency testing program samples that are associated with the method, a good internal audit could take a week or more.

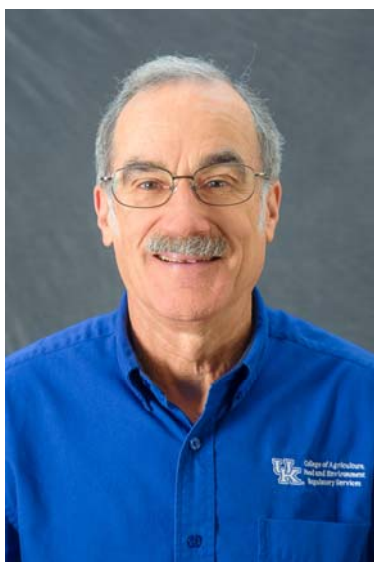
When we perform an audit of our quality management system, we are evaluating it to ensure it is conforming to UKDRS policies, contract commitments, and regulatory requirements. Evaluation of our method and quality SOPs to determine if we are “doing what we say and saying what we do”, ISO/

IEC 17025:2017's unofficial motto. This is a very long process and may take up to a month to complete. For every requirement from ISO, accreditation body, policies of UKDRS, we have to review the standard operating procedure to verify that it is correct. We completed this at the end of April of this year. The initial document started as a 30-page checklist but ended up as 83 pages of objective evidence! Based on the outcome of this audit, quality and/or administrative standard operating procedures are updated, revised, or archived. We currently have 18 standard operating procedures that pertain to quality and administration. Because of the audit of the quality management system, we updated 13 of quality standard operating procedures and wrote a new one. The quality unit, laboratory director, laboratory manager, each laboratory supervisor, and UKDRS' executive director are present during the meeting. We review the previous year's audit and determine if the action list is complete. Changes, both internal and external, relevant to the laboratory are reviewed. The risk registry and risk identifiers are reviewed as well as corrective actions, and non-conformances. Another important required evaluation is to assess the quality of each vendor's performance. From reading this shortened list it is obvious it is a detailed review.

We are continually looking for ways to improve quality at UKDRS. This is why we are heavily involved in organizations at the regional, state, national, and in some cases international levels. It is important 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 2014 and are accredited to the ISO/IEC 17025:2017 standard. We currently have 31 analytes which corresponds with 16 methods on our scope of accreditation for animal feed, fertilizers, and hemp. We will be re-assessed at the end of August and will be adding 17 additional analytes which corresponds to 8 additional methods! I'm proud of our accredited status and I'm proud of the people who perform these analyses! We are working towards this to ensure that we continue to provide unbiased quality results for our customers.

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

Personnel News –Retirement



David Tompkins retired from the Division of Regulatory Services on July 11 after over 48 years of service. Regulatory Services was his first job after college, having started here on July 30, 1973. He held several jobs here over the years but spent the last several as a supervisor in the Feed/Fertilizer laboratory. He's one of the few employees left that worked both in Scovell Hall and the Poundstone building (where we've been since 1990). We thank Dave for his many years of service and hope he enjoys a well earned retirement.

AAFCO is hosting a webinar on Hemp as a feed ingredient as shown in the notice below. There is no charge for this webinar but you must register in advance. You may read more about it and register at www.aafco.org



HEMP AS A FEED INGREDIENT; A NATIONAL DISCUSSION

Tuesday, August 9, from 12-4 p.m. EDT

Held Virtually

Why Isn't Hemp in Animal Feed?
A Discussion on Overcoming Challenges and
Gaining Approval

Presented by the



AAFCO
Association of American Feed Control Officials



NIHC
NATIONAL INDUSTRIAL
HEMP COUNCIL

Regulatory Services News is published by:

Division of Regulatory Services
College of Agriculture, Food and Environment
University of Kentucky
103 Regulatory Services Building
Lexington, KY 40546-0275

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