STATE OF THE BEEF SUPPLY CHAIN: SHOCKS, RECOVERY, AND REBUILDING

HEARING

BEFORE THE

SUBCOMMITTEE ON LIVESTOCK AND FOREIGN AGRICULTURE

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WITNESSES

STATE OF THE BEEF SUPPLY CHAIN: SHOCKS, RECOVERY, AND REBUILDING

WEDNESDAY, JULY 28, 2021

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON LIVESTOCK AND FOREIGN AGRICULTURE,
COMMITTEE ON AGRICULTURE,
Washington, D.C.

The Subcommittee met, pursuant to call, at 10:01 a.m., in Room 1300, Longworth House Office Building, Hon. Jim Costa [Chairman of the Subcommittee] presiding.

Members present: Representatives Costa, Spanberger, Hayes, Harder, Khanna, Axne, Rush, Craig, Johnson, DesJarlais, Hartzler, Rouzer, Kelly, Bacon, Baird, Hagedorn, Mann, Feenstra, Moore, and LaMalfa.

Staff present: Prescott Martin III, Lesly Weber McNitt, Caleb Crosswhite, Patricia Straughn, Erin Wilson, and Dana Sandman.

OPENING STATEMENT OF HON. JIM COSTA, A REPRESENTATIVE IN CONGRESS FROM CALIFORNIA

The CHAIRMAN. Good morning, everybody. The Subcommittee on Livestock and Foreign Agriculture will now come to order. The hearing this morning of the Subcommittee is on the *State of Beef Supply Chain: Shocks, Recovery, and Rebuilding.* We have four very good witnesses that will shed some light on the challenges we are facing across the country as a result of a multitude of factors.

First, let me commend Members of the Subcommittee here today and give you a shout-out for those who are here in person and those who are not, to deal with the safety issue and set good examples by wearing our masks. It is something that none of us really care to do; but, because of good public health safety, it is something that we should do. And for the safety of our staff and fellow Members, I want to thank those of you. It is required in this hearing room per the guidance of the attending physician that was issued yesterday, and it is just a frustrating thing for all of us that this new variant has raised a new level of outbreak among those primarily who are unvaccinated. And so, it is a hope and a prayer that I urge all of our American citizens to please, please get vaccinated. It is the right thing to do for yourselves and for your family, and for our nation. It is just, as kids we get vaccinated because we want to, that is not the subject of this hearing, but I remind people in my district all the time, and it is a good thing to remind all of us.

So, this is a hybrid hearing. Proceedings allow, obviously, for folks to participate as they are from their offices, and thank you all for being engaged this morning.

For Members of the Committee, as you probably heard, we are going to have votes at 11 o'clock, so Dusty and I, the Ranking Member, we are going to try to figure out how to finesse it when the votes are called. I am told there are three votes, so that is about an hour. So, I want to still try to get our work done. But I would like to make sure, at least, we have our witnesses all give their testimony before the votes are called, and then we will figure out what works best. Whether we try to keep the hearing going and people alternate going to vote and then come back, or whether we just adjourn. But I want to get through this so that—everybody has busy schedules. Some of us have multiple hearings that are going on right now. I have a Foreign Relations Committee markup at 10 o'clock that I am going to try to vote on.

And so, we are all busy and I am very sensitive to your efforts to try to meet all your demands today, as I am trying to meet mine.

With that housekeeping effort done, let me begin the hearing in earnest. Obviously, as a result of the last 15, 16 months, we have learned—I hope we have learned some lessons. One of them that I think I share with all the Members of this Subcommittee is that because of the pandemic, as a result of closing schools and closing restaurants, we last spring learned that this complex, complicated food supply chain that we have in our country was virtually turned upside down, and bottlenecks ended up taking place in ways that we could never have imagined. Therefore, it is incumbent upon us in the Subcommittee to really examine what took place in this last year, because I think we all believe that food is a national security issue. We don't tend to look at it that way, but I try to remind folks that less than five percent of America's population every day works so hard at all the levels of food production to put food on America's dinner table. And we do it so well, in some ways that people take it for granted. A lot of people think their food comes from the grocery store or their favorite restaurant. And we know, of course—I mean, they may get it at—well, most of them get it at the grocery store or their favorite restaurant, but it doesn't come from there. And so, therefore, I think we have learned that we are vulnerable. We are vulnerable in a number of different ways, and the purpose of today's hearing is really to look at that, to look at the impacts.

Let me give you, as we like to say, all politics are local. But my own situation in California, in 2019 the cattle and calves industry in my state were valued at over $3 billion, placing them in the top four valued commodities in California. So, obviously like all of you, I have an interest in making sure that our ranchers, producers, our cattlemen and -women have resiliency as it relates to the ability to deal with supply chains, fair markets in which they are able to put that food on America's dinner table.

Over the past several years, the livestock industry has been subject to three notable shocks, each which has illuminated various vulnerabilities in the supply chain, and has created instability in the marketplace. And that is really going to be our discussion today.

The fire at one of the country's largest beef processing plants in Holcomb, Kansas, in 2019 was the first event. That 4 month closure of this large plant created significant reduction in processing capacity, which led to a drop off in fed cattle prices. The market has just been very volatile in the last couple years.

The next event, I mentioned already, was the COVID–19 pandemic. As we are all aware, the pandemic had an enormous impact in every segment of America's economy and the beef supply chain was not spared. Anyone who tried to buy ground beef or a steak at the grocery store during the first few months of the pandemic experienced the bottleneck in the supply chain firsthand. At the farmgate, producers were dealing with oversupply and, as I noted a moment ago, incredible volatility in prices. That is not good.

President Biden and his Administration, I just think, deserve great credit for their hard work over the last 6 months to help Americans get back on their feet. I also want to give credit to all of the Members here last year who helped us pass multiple COVID relief packages. The most recent one, of course, is the American Rescue Plan (Pub. L. 117–2), which has provided relief to our farmers and ranchers as they continue to rebuild, and Secretary Vilsack and his team are, I know, working overtime to implement this relief.

The third shock that I think we have to look in depth—and we are not going to solve that problem this morning, but we have some witnesses who can certainly add some value as to what we might think about doing—is cyberattack, cyberattack on JBS over Memorial Day weekend. Cyberattacks like this will only increase. Their potential effect on our food and agriculture system cannot be ignored, just as they cannot be ignored as their potential impacts on our electrical grid, on our financial systems, and every other aspect of American life, because in the 21st century, we are all connected. And that provides a lot of benefits and efficiencies, but it provides a lot of vulnerabilities, and our food supply chain, we have learned the hard way about potential vulnerability to cyberattacks. So, we cannot allow food security, which is national security, and the protecting our food system from foreign interferences to be disrupted, and it something that I want to work with all of you in terms of thoughts on how we protect our vulnerabilities from cyberattacks.

So, it is our job on the Subcommittee to get to the bottom of many of the complex challenges confronting agriculture and help our farmers, ranchers, dairymen and -women overcome these challenges. Today we will hear from four very good witnesses—I hope you have had a chance to read their testimony—who will tell us where they think the vulnerabilities in our food supply chain lie and their innovative ideas for helping the beef supply chain adapt, adapt, and to become more resilient, so that we can use what we have learned over these three factors that have impacted us over the last 2 years, and create some positive change.

Now, my Subcommittee staff, who makes me look good in spite of myself, will probably be upset that I didn't fail to read the earlier part of the briefing, but I will read it now.

Obviously, after brief opening remarks, Members will receive testimony from out witnesses, and then we will follow the normal process where the Ranking Member will make his thoughts heard,

and then Members will be recognized in the order of seniority, alternating between Majority and Minority, and when you are recognized, you all know the rules. You have 5 minutes and we try to be sensitive to everybody's time. If you are in the middle of a question being responded to, I will not interrupt the response to the answer to your question. But also, I am not a wild fan of people spending 4½ minutes making a statement and then asking the question. I have been chairing hearings for a long time, so just a little thing I have.

Anyway, if you are not speaking, remain muted because we have this virtual hearing that we are dealing with, and it is difficult. It is challenging, and for those Members who are—because of other conflicting obligations—working out of your office, may I remind you what I try to remind myself—my staff reminds me, and that is when you are not speaking, please press the mute button. I know sometimes you are multitasking, but I don't think the rest of us need to hear some of the other efforts that you are multitasking on. So, please mute your microphone if you are not dealing with your 5 minutes.

Anyway, the timer, I am told, because of our good, good staff will remain visible, right? Okay. So, in consultation with the Ranking Member, pursuant to Rule XI(e), I want to make Members of the Committee aware that Members of the full Committee may join us today. Those are the magic words. She was wondering whether I was going to say them or not. I have said that.

[The prepared statement of Mr. Costa follows:]

PREPARED STATEMENT OF HON. JIM COSTA, A REPRESENTATIVE IN CONGRESS FROM CALIFORNIA

Good morning. To start, I'd like to thank our witnesses, my Ranking Member Mr. Johnson, and the other Members of the Subcommittee for participating in today's hearing to discuss a topic that continues to garner a great degree of attention, and rightfully so. The shocks that our cattle industry have undergone in the last 2 years have impacted millions of people along the entire supply chain—from the cattle producer to the feeders, processors, retailers, and consumers.

Livestock are a critical part of our food system and a crucial component of the economy in my home State of California. In 2019 cattle and calves in my state were valued at over $3 billion, placing them in the top four valued commodities in the state. So, I have a substantial interest in making sure that our producers have resilient supply chains and fair markets in which to trade. Over the past several years the livestock industry has been subject to three notable shocks, each of which has illuminated various vulnerabilities in the supply chain and created instability in the marketplace.

The fire at one of the country's largest beef processing plant in Holcomb, Kansas in 2019 was the first event. The 4 month closure of a large plant created a significant reduction in processing capacity, which led to a drop off in fed cattle prices.

The next event was the COVID–19 pandemic. As we are all aware, the pandemic had an enormous impact on the entire economy and the beef supply chain was not spared. Anyone who tried to buy ground beef or a steak at the grocery store during the first few months of the pandemic experienced the bottleneck in the supply chain firsthand. At the farmgate, producers were dealing with oversupply and incredible volatility in their prices.

President Biden and his Administration deserve great credit for their hard work over the past 6 months to help Americans get back on their feet. I'd also like to give credit to my colleagues in Congress who helped pass multiple COVID relief packages, most recently the American Rescue Plan, which has provided relief to our farmers and ranchers as they continue to rebuild. Secretary Vilsack and his team are working overtime to implement this relief.

The third shock is the cyberattack on JBS over Memorial Day weekend. Cyberattacks like this will only increase, and their potential effect on our food and

agriculture system cannot be ignored. I think everyone on this Committee understands that food security is national security and protecting our food system from foreign interference and disruption is something that must be taken seriously.

It is our job on this Subcommittee to get to the bottom of the most complex challenges confronting agriculture and to help our farmers and ranchers overcome these challenges. Today we will hear from four expert witnesses, who will tell us where the vulnerabilities in our supply chain lie and share their innovative ideas for helping the beef supply chain adapt to become more resilient, so that we can use what we learn today to create positive change. Before the introduction of our witnesses, I'd like to recognize the Ranking Member, Mr. Johnson of South Dakota, for any remarks he'd like to make.

The CHAIRMAN. I think we are all there, and I will defer to my friend, the Ranking Member, for his opening statement, because I do not see the chair or the Ranking Member of the full Committee here. So, we are going to go on. Dusty?

OPENING STATEMENT OF HON. DUSTY JOHNSON, A REPRESENTATIVE IN CONGRESS FROM SOUTH DAKOTA

Mr. JOHNSON. Thank you very much, Mr. Chairman, and I will start with two notes of gratitude. The first is to you. When Congress focuses in a bipartisan way on issues, good things happen and these witnesses, this is going to be a good thing. Thank you.

And I also just want to note my gratitude to other Members of this Subcommittee. I mean, when I think about the number of conversations, earnest conversations, honest conversations I have had on these topics with Jim Costa or Randy Feenstra or Tracey Mann or Jim Baird or Don Bacon or Vicky Hartzler or anybody who is on Zoom, it is amazing. I mean, I think the American people should feel good that their Members of Congress really do care about these issues in an emotional way, but also in a data-driven way. Because for those of us who represent ranchers or backgrounders or stockers or feeders, we know how emotional and how unpredictable the last couple of years have been. And Mr. Chairman, you noted it right. Black swan event after black swan event, and it has made it really hard for the people who try to feed America. And I think even the urban folks have seen how critically important, but also how fragile these supply chains are.

You are right, Mr. Chairman. Food is a national security issue, and it is something that all Americans probably should pay more attention to than they do.

I thought in the wake of COVID or during the middle of COVID we did some really good bipartisan work. One hundred forty Members of Congress stepped up in a bipartisan way to work with the Administration to make sure that CFAP was rolled out to the people in the cattle industry who absolutely needed that assistance. And I think as we move past, hopefully, COVID, we will understand that that was extremely important relief, but it was temporary relief for an extraordinary time. And the market deficiencies that were laid bare during that time aren't just going away, so we need to focus on moving from triage to long-term recovery. The cattle markets and processing are incredibly complex industries, and they are all trying to respond to market signals. Some of our presenters today will talk about how they are always seeking but never finding equilibrium, that balance to make sure that the number of head of cattle match the processing capacity, match consumer demand, and *vice versa.* Every step along that way is

fraught with complexity, and I think one thing that we are all are going to hear loud and clear in the testimony today is that we don't have enough processing capacity. And that is a market failure that has negative impacts both on consumers who want to eat the beef, as well as producers who are trying to raise it. And we need to figure out how to increase that capacity. The lack of capacity has hindered the American ranchers' ability to reap some of the benefits of an increasing demand, an increasing appetite for beef across the world.

As I move toward my close, though, I don't want to be so negative because I think we understand that with challenging times come opportunities. And since the pandemic, we have seen a tremendous amount of action to increase and to diversify our processing capacity. I am glad to see that the bill that I had with Congresswoman Angie Craig that leveled the playing field for small processors when they run overtime and need Federal inspectors, I was glad to see that that passed and I am glad to see that that is being rolled out. I am also pleased with the announcements that $500 million is going to be available to increase resiliency in the processing sector. My goodness, how much we need that resiliency. My hope and that of a number of people on this Subcommittee is that we can allocate those funds in a way that promotes producer and cooperative ownership that leverages funding to focus on enhancing processing capacity, and on lowering cost to entry for that diversified processing ownership.

I also want to call out the role of private-sector, because obviously, that is the biggest piece of this puzzle, and we have a number of new, independent processors that have announced plans to build facilities. And to the extent that this Committee can remain focused on reducing those barriers to entry, so many regulatory hurdles, so many capital hurdles, so many workforce hurdles, to the extent that we can stay focused on reducing those barriers to entry, we are going to have a healthier marketplace.

I will close, Mr. Chairman, by noting what we all know, that American ranchers have worked for generations to improve quality and efficiency so they can feed their fellow Americans and people all across this globe, and if we do it right, we are going to be in a position to help them continue that glorious and that sacred mission for generations more to come. And if that isn't work worth doing, I don't know what is.

And with that, I would yield back.

The CHAIRMAN. I thank the gentleman for his comments, and as I have indicated, any Members who wish to have a statement, we can submit that for the record.

[The prepared statement of Mr. Mann follows:]

PREPARED STATEMENT OF HON. TRACEY MANN, A REPRESENTATIVE IN CONGRESS FROM KANSAS

On behalf of the farmers and ranchers in the 1st District of Kansas, I am glad to participate in today's Subcommittee hearing to address the beef supply chain. This issue is especially near and dear to me, since both sides of my family have farmed and fed cattle in western Kansas for more than 120 years.

The Big First ranks number one among Congressional Districts for the value of sales of cattle and calves, at more than $9 billion annually in the latest Census of Agriculture. There are more than 4.4 million cattle and calves raised in my district

and significant packing capacity with more than 20 percent of the nation's beef slaughter capacity.

We see the entire beef supply chain in the Big First, from cow-calf producers to cattle feeders to the packers. More broadly, the beef sector supports the grain producers, equipment manufacturers, veterinarians, livestock markets, and many other businesses that populate rural towns across Kansas.

In a competitive cattle market, it is vital for producers to be able to differentiate their product to eventually suit the tastes of consumers. As seen by the growing demand for beef, selective breeding and nutrition that have increased quality bring opportunities for producers to negotiate a premium price for their cattle. These contracts allow feeders to benefit from making a value-added investment and provide some certainty in a volatile market.

As we have seen over the last several years, market disrupting events can have lasting impacts on the beef supply chain. While the Tyson plant in Holcomb was back up and running more quickly that we expected, COVID–19 followed soon after and made price recovery more difficult. We are still seeing a large supply of slaughter-ready cattle in the supply chain. Combined with labor shortages, this backup keeps cattle prices down, even when there is strong demand from consumers domestically and abroad.

There have been questions regarding packer behavior in the marketplace, and I have asked USDA and DOJ to provide details on any findings of misconduct. This uncertainty has also led to several legislative proposals and government solutions for a market that has historically seen high and low prices in both the beef and cattle sectors. Before we consider more government involvement, I would encourage my colleagues to consider the possibility that this could limit producers' ability to choose how to market their own cattle.

We need to reduce the oversupply of cattle by ensuring our packing plants are back to full operating capacity. The additional unemployment benefits are hurting the labor shortage, and I have encouraged our Governor to put an end to the supplemental unemployment payments. We should also work to increase shackle space, and also increase price discovery.

As they have for decades, I am confident that our farmers and ranchers will rise to the challenge and continue to provide a safe and affordable food supply. I look forward to hearing from each of the witnesses today and working with my colleagues on these vital issues.

Thank you.

The CHAIRMAN. Let's get on to our witnesses here so we can begin their testimony. It is a busy day today and tomorrow, and so we have a lot of things going on.

But I am please to welcome a very distinguished panel that our staff were able to put together here for this important hearing. They have a wide, wide range of experience and expertise.

So, our first witness today—and I don't know what box they are in, in this virtual here—is Dr. Jayson Lusk. I think we all lament. Hopefully we can knock down this pandemic, but I like to have the witnesses here. I like to talk to them before the hearing starts and get a chance to interact. But Dr. Lusk is a Distinguished Professor and Head of the Agricultural Economics Department of Purdue University. Lusk is a food and agriculture economist who studies what we eat and why we eat it. That is really a subject of a much longer conversation, I think. He has a bachelor's of science and food technology from Texas Tech, a Ph.D. in agriculture economics from Kansas State University. My gosh. Purdue, Texas Tech, Kansas State, and has appointments to Mississippi State and Oklahoma State Universities. Obviously, he made it a point of visiting many of the wonderful universities in this country. So, let us begin with Dr. Lusk.

Dr. Lusk, are you there?

Dr. LUSK. Yes, I am here.

The CHAIRMAN. Can you hear us?

Dr. LUSK. I can.

The CHAIRMAN. Okay, please begin.

STATEMENT OF JAYSON L. LUSK, PH.D., DISTINGUISHED PROFESSOR AND HEAD, DEPARTMENT OF AGRICULTURAL ECONOMICS, PURDUE UNIVERSITY, WEST LAFAYETTE, IN

Dr. LUSK. Chairman Costa, Ranking Member Johnson, and Members of the Subcommittee, thank you for inviting me here today. As indicated, my name is Jayson Lusk. I currently serve as a Distinguished Professor and Head of the Agricultural Economics Department at Purdue University.

Beef and cattle markets have been extraordinarily volatile over the past couple years, and when you are trying to understand the current challenges, I think some historical perspective is warranted.

Over the past decade, cattle inventories have followed a V-shaped pattern. From 2010 to 2015, cattle slaughter fell by more than 16 percent as producers cut inventory in response to high feed prices and drought. The change in cattle numbers affected the packing sector. There was, at that time, too much packing capacity relative to the number of cattle and some packers exited because it was no longer profitable. Following a common cyclical pattern, producers retained heifers and expanded their herds to capture the benefits of the higher prices that were experienced in 2014 and 2015, but by 2019, total cattle slaughter had increased almost 17 percent relative to the 2015 low. The packing sector, having adjusted to a smaller herd size, now found itself in the opposite position. There was a high number of cattle relative to capacity, which put downward pressure on cattle prices. And it was against this backdrop that we experienced the unexpected fire, pandemic, and cyberattacks.

There is a key lesson to take from this recent historical episode. There are long lags and ripple effects in cattle markets. My recommendation to you is don't overly focus on what is happening today, but make policies for the future.

With that background, I am going to briefly touch on three issues facing the industry. The first is capacity. As noted, processing capacity in 2020, even if the pandemic hadn't occurred, was likely going to be tight. But today, we appear to be in a different phase of the cattle cycle. Cattle inventory is falling, feed prices have been rising, there is a drought in the West. These factors will likely bring cattle numbers closer in line with current capacity. Moreover, there are number of private initiatives to increase automation and add more capacity. More capacity, fewer cattle will help support future cattle prices. Making additional government investments in capacity for the purpose, at least, of improving cattle prices may be fixing yesterday's problem.

Support for small and local processors may benefit local economic ecosystems and may increase custom harvest operation for producers, but these operations, because they lack economies-of-scale, must focus on quality or service to be competitive.

The costs of adding packing capacity are not limited to concrete and iron. I encourage you to consider other barriers that limit new entrants. These factors include labor availability and costs of com-

plying with regulations related to labor, food safety, zoning, transportation, and more.

The second issue relates to proposals to require a share of cattle to be sold on a negotiated or cash basis, as opposed to a formula or grid, in an effort to improve price transparency. An important distinction needs to be made between price levels and price volatility. And even if all cattle were traded on a negotiated basis, the price level would not necessarily improve.

Are there less costly ways to improve price discovery than a mandate? Livestock Mandatory Reporting, LMR, is one tool that has improved price transparency. Continued research into this legislation might further benefit the industry. Market maker programs that incentivize voluntary participation and cash markets is another tool. Even if a mandate were pursued, it might be made more efficient if coupled with a cap-and-trade system where obligations to secure cattle in a cash market might be bought and sold in a secondary offset market similar to what currently exists for fuel manufacturers mandated to blend biofuels. Including negotiated grids in a mandate would also lessen the cost of such a policy.

Finally, I encourage you to focus on policies that improve the health of the entire industry. Discussions of cattle prices and packing capacity can give the incorrect impression that beef and cattle markets are a zero-sum game. But consider policies that increase the size of the pie for all players. Examples include improving trade relations that allow products to flow to consumers who value them most, and investments in research and innovation that improve demand or improve productivity.

In conclusion, my view is that the beef cattle system responded remarkably well to a series of large and unexpected disruptions. Cattle prices have been on the rise. Consumer demand is strong, and these core facts should remain front of mind when considering policy changes because the cattle industry is constantly evolving, and there is a need to remain competitive with other plant- and animal-based proteins that have a place on the consumer's dinner plates.

[The prepared statement of Dr. Lusk follows:]

PREPARED STATEMENT OF JAYSON L. LUSK, PH.D., DISTINGUISHED PROFESSOR AND HEAD, DEPARTMENT OF AGRICULTURAL ECONOMICS, PURDUE UNIVERSITY, WEST LAFAYETTE, IN

Chairman Costa, Ranking Member Johnson, and Members of the Subcommittee, thank you for inviting me here today. I am a food and agricultural economist and I serve as Distinguished Professor and Head of the Agricultural Economics Department at Purdue University.

I will begin by providing some background on some of the economic factors that have contributed to the volatility in cattle and beef markets in recent years. Then, I will shift my focus to three economic issues currently facing the beef cattle industry: packing capacity and resiliency, price discovery, and the importance of trade and innovation.

For the past couple years, beef and cattle markets have been extraordinarily turbulent and volatile. Major events include the loss of a major packing plant to fire in 2019, demand-induced disruptions from COVID–19 resulting from the decline in restaurant spending and the spike in grocery spending, supply-induced disruption from COVID–19 resulting from the worker illnesses in packing plants, increasing feed prices, drought in the West, and recently, increased Chinese imports and cyber-

attacks. Only one other year in the past 30 has witnessed more volatility in live fed cattle prices than 2020.[1] Consumers likewise experienced significant price shocks. Retail beef prices increased 25% year-over-year price in June 2020 before falling 3% year-over-year in May 2021.[2]

When trying to understand the current challenges, some historical perspective is warranted. Over the past decade, cattle inventories have followed a V-shaped pattern. Corresponding cattle prices have followed an inverse V-shaped pattern. From 2010 to 2015, total number of commercial cattle slaughtered fell by more than 16%.[3] The decline resulted from producers cutting inventory as a result of a dramatic increase in feed prices and a drought in some parts of the Midwest. The change in cattle numbers affected the packing sector. There was, at the time, too much packing capacity relative to the number of cattle, and returns to cattle processing took a hit. Some small and medium packers exited because it was no longer profitable, and some large packers shuddered plants in an attempt to align capacity with inventory.

The high levels of capacity relative to cattle numbers, coupled with strong demand, led to a rise in cattle prices. Following a common cyclical pattern (the "cattle cycle"), producers retained heifers and expanded their herds to capture the benefits of higher prices that were experienced in 2014 and 2015. By 2019, total commercial cattle slaughter had increased 16.7% relative to the 2015 low. The packing sector, having adjusted to a smaller herd size, now found itself in the opposite position: there was a high number of cattle relative to processing capacity, which put downward pressure on cattle prices. It was against this backdrop that we experienced the unexpected fire, pandemic, and cyber-attack that further exacerbated the effects of limited capacity. If these unexpected events had occurred in 2014 or 2015, the impacts on producers would have been much different.

There is a key lesson to take from this recent historical episode. There are long lags and ripple effects in cattle and beef markets. A producer makes a decision today to breed a cow, and it will be roughly 3 years till the resulting offspring is ready for market. Likewise, investors today decide to build a new packing plant. It will be years before construction is finished and the capacity is brought online. Everyone is betting on the future with information that ultimately be 2 to 3 years old by the time outcomes are realized. Cattle inventories have already started to fall, and cattle prices have risen since last summer. My recommendation to you, as policy makers, is the following: do not overly focus on what is happening today. Consider what will be needed 3 to 5 years from now. Market participants adapt to changing circumstances, although sometimes more slowly than we'd like because of biological and construction lags, but policy ideally should focus on longer-run forces that improve the well-being of producers and consumers in an industry.

With that backdrop, I will move on to the first of three current issues facing the industry. There are a number of state and Federal initiatives to increase processing capacity. As previously, noted, processing capacity in 2020, even if the pandemic hadn't occurred, was likely to be "tight," which contributed to downward pressure on cattle prices. We appear, however, to be in a different phase of the cattle cycle. Cattle inventory is falling. Feed prices are rising. There is a drought in West. These factors will, over time, likely bring cattle numbers closer in line with current capacity. Moreover, even absent Federal investments, there are a number of private initiatives to increase automation and add more packing capacity. More capacity, and fewer cattle, will help support future cattle prices. But, as the experience of the past decade has revealed, that will not be the end of the story. Whether we are setting ourselves up, in 5 years' time, for another situation in the packing sector like the one experienced in 2014 and 2015 remains to be seen. Additional government investments in capacity, for the purpose of improving cattle prices, may be fixing yesterday's problem.

There is another argument being made for adding capacity: improving resiliency to the sector. Extra capacity could be seen as a form of insurance against unexpected capacity reductions from events like fire, pandemic, or cyber-attack. COVID–19 infections led to and dramatic reduction the nation's beef slaughter capacity. There was little excess capacity in the system and nowhere for market-ready cattle

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[1] Volatility, in this instance, is defined as the annual average of the week-to-week absolute value of the percent change in 5-market weighted average live steer price as reported by the USDA Agricultural Marketing Service. There was similar but slightly higher volatility in 2016 compared to 2020.

[2] Figures are my calculations based on data from the Bureau of Labor Statistics.

[3] Figures are my calculations based on data from USDA, National Agricultural Statistics Service.

to go.[4] My research with Purdue colleague Meilin Ma indicates that even if we would have had a more distributed packing sector consisting of more small and medium sized plants instead of a small number of large plants, the price spread dynamics and beef supply disruptions would not have likely have been appreciably different than what we witnessed.[5] The problem at the time was not the size or localness of the plants but total industry capacity.

However, excess capacity is expensive, and it is in no individual packer's interest to routinely operate at significantly reduced capacity. Imagine approaching an investor asking for tens of millions of dollars with a plan to only operate a facility at only 50% capacity. Few bankers would agree to such a deal. Support for subsidizing additional processing capacity might be justified on public insurance grounds, but ultimately, the ebbs and flows of the cattle cycle will determine the long-run size of the packing industry, and newly subsidized plants will be at an advantage over older existing plants when cattle numbers come back in line with capacity and ultimate profitability determines the size of the packing sector. Support for small and local processors might benefit local economic ecosystems and increase custom harvest operations for producers, but these operations, because they lack economies-of-scale, must focus on quality and service to be competitive, and are such a small part of the national industry that investments at this size are unlikely to significantly alter the aggregate industry capacity. It is also worth noting that costs of adding packing capacity are not limited to concrete and iron. I encourage you to consider other costs and barriers that limit new entrants thus expanded capacity. Availability of labor has been a significant challenge for the industry and labor constraints put a limit on processing capacity. Other factors include the costs of complying with Federal, state, and local regulations related to labor, food safety, zoning, transportation, and more.

Second, in light of the relatively low cattle prices experienced in 2020, there have been a number of proposals to affect the marketing of cattle. One set of concerns has focused on the share of cattle sold on a negotiated or cash basis. While the share of cattle sold in this manner, roughly 20%, has not changed much since the high-cattle-price era experienced in 2014 and 2015, it is lower than was the case a decade ago. Cattle sold on a formula basis often utilize the negotiated, cash price as a base. Thus, trades on a relatively small number of cattle influence the price for a much larger number of formula-priced cattle. A concern has emerged as to whether there are enough trades in the cash market to truly reflect market fundamentals. In efforts to improve price discovery, an important distinction needs to be made: price levels and price volatility. Even if all cattle were traded on a negotiated, cash basis, the price level would not necessarily improve; however, we might be more confident that any given transaction would be reflective of the "true" underlying supply and demand conditions at the time and location. Whether, in fact, there are too few cash transactions to reflect market fundamentals is debatable.

Attempting to mandate more cattle be sold in a negotiated, cash basis has potential benefits and certain costs. The fact that most producers and packers choose to sell cattle using alternative marketing arrangements suggests they see benefits in this form of marketing in the form of increased certainty, lower transactions costs, and supply chain coordination. Mandating a certain percent of cattle be sold on a negotiated basis would entail some producers and packers foregoing a marketing method they currently find more desirable. That is a cost. Moreover, strengthening of consumer demand for beef over the past couple decades has occurred over a period in which there was increased use of formula pricing that rewarded quality improvements. Eroding the ability of consumers, retailers, and packers to incentivize quality through formulas and vertical coordination may have detrimental impacts on demand.

The best economic case for mandating more negotiated transactions rests on the argument that price discovery is a public good. Are there less costly ways to improve price discovery than a mandate? Livestock Mandatory Reporting (LMR) is one tool that has improved price transparency and discovery. Continued research into improvements in this legislation might further facilitate price discovery. Taxes to avoid, or subsidies to use, negotiated cash markets are seldom mentioned despite having similar economic intuition as a mandate. Even if a mandate were pursued, it might be made more efficient if coupled with a "cap and trade" system, where obligations to secure cattle in a cash market might be bought and sold in a sec-

[4] There is some short-term ability to bring extra capacity online by packers running additional shifts on weekends or moving steer and heifer slaughter to cow-kill plants.

[5] Ma, M. and J.L. Lusk. "Concentration and Resilience in the U.S. Meat Supply Chains." Paper presented at National Bureau of Economic Research (NBER) conference on Risks in Agricultural Supply Chains, May 21, 2021.

ondary "offset" market similar to what currently exists for fuel manufactures mandated to blend a given amount of biofuels. Including negotiated grid or formula transactions in a mandate would also lessen the costs of the policy. It is important to consider solutions that may be less costly and restrictive than a mandate because the cattle industry is constantly evolving and needs to remain cost-competitive with other animal- and plant-proteins to have a place on consumers' dinner plates.

I will conclude with an encouragement to focus on policies that improve the health of the entire industry. Discussions of cattle prices and packing capacity can give the impression that beef and cattle markets represent a zero-sum game. But, one party's gain does not have to come at the expense of another. What policies increase the size of the pie available to all participants: cow-calf producers, backgrounders, feedlots, packers, retailers, and ultimately, consumers?

As witnessed in recent months, improved trade relations have the ability improve economic circumstances for multiple segments of the industry. The U.S. exports about 12% of beef production. Trade agreements are important to help open markets for U.S. producers to allow products to flow to consumers who value them most.

Investments in research and innovation that increase demand or improve productivity are likely a net win for consumers, producers, and the environment. Had we not innovated since 1970, about 11 million more feedlot cattle would have been needed to produce the amount of beef U.S. consumers actually enjoyed last year. Innovation and technology saved the extra land, water, and feed that these cattle would have required, as well as the waste and greenhouse gases that they would have emitted. Investments in research to improve the productivity of livestock and poultry can improve producer profitability, consumer affordability, and the sustainability for food supply chain.

Despite the challenges of the past couple years, the beef cattle system responded remarkably well to a series of large, unexpected disruptions. Producer prices have been on the rise. Consumer demand is strong. These core facts should remain front of mind when considering changes that would significantly affect the cattle industry, going forward.

The CHAIRMAN. Thank you very much for your insightful testimony. I think you are suggesting that we look at the long-term as we deal with the challenges that we are facing in terms of the supply chain, and I know that there will be questions based upon your very good testimony. So, stay tuned, because we all have questions.

Our next witness today is Dr. Jennifer van de Ligt, the Director of Integrated Food Systems Leadership Program, the Director of Food Protection and Defense Institute, and an Associate Professor of the University of Minnesota. A key focus of Dr. van de Ligt's current research portfolio is building collaborations to advance food and feed security, safety, and defense, and supply chain resilience, which is all part of, really, this morning's Subcommittee hearing.

Dr. van de Ligt completed her Ph.D. in nutrition from the University of Kentucky, and what I am noticing here is a trend. Our witnesses here today seem to have had very good education from a number of American universities, so good for all of you.

Dr. van de Ligt, would you please begin your testimony?

STATEMENT OF JENNIFER VAN DE LIGT, PH.D., ASSOCIATE PROFESSOR VETERINARY POPULATION MEDICINE, COLLEGE OF VETERINARY MEDICINE; DIRECTOR, INTEGRATED FOOD SYSTEMS LEADERSHIP PROGRAM; DIRECTOR, GRADUATE STUDIES APPLIED SCIENCES LEADERSHIP; DIRECTOR, FOOD PROTECTION AND DEFENSE INSTITUTE, UNIVERSITY OF MINNESOTA, ST. PAUL, MN

Dr. VAN DE LIGT. Thank you, Chairman Costa, Ranking Member Johnson, and Members of the Subcommittee on Livestock and Foreign Agriculture. Thank you for inviting me to participate in today's hearing. It is an honor to appear before you.

I am the Director of the Food Protection and Defense Institute, and Associate Professor in the College of Veterinary Medicine at the University of Minnesota. And as Chairman Costa indicated, I also have experience from the University of Kentucky, as well as from the University of Illinois and North Carolina State University. So, with the theme of representing the country and its fine educational institutions.

Since 2004, the Food Protection and Defense Institute, an Emeritus Homeland Security Center of Excellence, has partnered with stakeholders across government, industry, and academia to protect the food system from disruption. Cyber risk, the focus of my testimony, is not new to the food and ag sector, but the risk of significant business disruption and national security threats from cyberattack are growing.

An evolving cyber risk in the food and ag sector is the growing dependence upon cyber-based information and operational technology systems. These operational technology systems manage the most critical aspects of food production, typically have the lowest level of integrated cybersecurity protections, and are often omitted from enterprise cybersecurity plans, protections, and training.

In response to the USDA request for public comment on supply chains for the production of agricultural commodities and food products, we recommended five specific actions for the USDA to take to improve cybersecurity within the national food and agriculture supply chains. These actions are outlined in my written testimony and require that USDA serve as the lead agency in collaboration with FDA, DHS, and FBI with consultation of food and ag insurance and cybersecurity industry partners.

So, why should these actions be taken? The food and ag sector is incredibly diverse, from small businesses and family farms to multi-national corporations that produce an infinite variety of foods. All of these businesses are individually vulnerable to cyberattack. On a broader scale, though, the food system is one of the most interconnected systems within the critical infrastructures. From a cyber perspective, this amplifies the attack surface and the risk. It also amplifies the potential magnitude of system disruption and failure from a cyberattack, including its secondary and tertiary cascading impacts.

For example, the recent JBS cyberattack disrupted meat processing operations in several countries, and simultaneously caused disruptions to supply chains, logistics, and transportation to customers, and it increased consumer prices. Additionally, the food and ag sector is labor intensive. A history of labor shortages coupled with technology advancements have driven automation in the sector. With increased automation and computational and network complexity, cyber risk also increases.

Regardless of why cyber risk exists, cyberattacks in the food and ag sector have the potential to cause catastrophic supply chain disruption, and can endanger our national security.

As a hypothetical example of a national security threat, consider for a moment the impact if both of the only two HDPE pellet plants—those are the plants that produce the gallon milk jug preforms—were victims of a simultaneous cyberattack. This is not unrealistic. We do know that during Hurricane Katrina, when just

one of these HDPE facilities was compromised, the supply of fluid milk at the consumer level plummeted to shortage levels in many areas of the country, while dairy farmers dumped millions of gallons of milk. A situation such as this could be repeated and affect a broad area of the nation in the event of a targeted cyberattack.

It should also be recognized that the food and ag sector partners must balance a multitude of supply chain, food safety, labor, financial, and other operational risks, in addition to cyber risk. Not only does managing cyber risk increase operational costs, but there are very few experts with the knowledge and experience to effectively enhance cybersecurity in the food and ag operational environment. This type of expert is often recognized as irreplaceable, and sometimes are referred to as unicorns within the food industry. We need to train and field many more of them.

Securing the vast cyber infrastructure and electronic information system sustaining America's food and ag supply system is vital to the economic totality of the system, and to our nutritional and national security. If we do not act, we risk the nation's ability to provide a sufficiency of nutrition, the very essence of well-being for our friends, family, colleagues, constituents, and institutions.

We appreciate the opportunity to engage and contribute to this national discussion. I look forward to further discussion.

[The prepared statement of Dr. van de Ligt follows:]

PREPARED STATEMENT OF JENNIFER VAN DE LIGT, PH.D., ASSOCIATE PROFESSOR VETERINARY POPULATION MEDICINE, COLLEGE OF VETERINARY MEDICINE; DIRECTOR, INTEGRATED FOOD SYSTEMS LEADERSHIP PROGRAM; DIRECTOR, GRADUATE STUDIES APPLIED SCIENCES LEADERSHIP; DIRECTOR, FOOD PROTECTION AND DEFENSE INSTITUTE, UNIVERSITY OF MINNESOTA, ST. PAUL, MN

Chairman Jim Costa, Ranking Member David Rouzer, and Members of the Subcommittee on Livestock and Foreign Agriculture, thank you for inviting me to participate in today's hearing. It is an honor to appear before you.

I am the Director of the Food Protection and Defense Institute and Associate Professor in the College of Veterinary Medicine at the University of Minnesota.

The Food Protection and Defense Institute (FPDI) at the University of Minnesota is an Emeritus Homeland Security Center of Excellence dedicated to providing leading-edge research, technical innovation, and education to protect the food system from disruption. Since 2004, FPDI has partnered with stakeholders across government, industry, NGOs, and academia to assure product integrity, supply chain resilience, and brand protection throughout the food and agriculture sector.

I have an extensive background in food defense, animal feed and human food production, human and animal nutrition, systems modeling, and scientific and regulatory affairs, with academic, industry, and global perspective. My academic career has focused on building collaborations to assure effective public-private partnership and stakeholder engagement to advance food and feed security, safety, defense, and supply-chain resilience. Prior to joining the University of Minnesota, I held numerous leadership positions at a multinational food company operating in 70 countries where I provided nutrition, regulatory, and scientific affairs expertise across their human food and animal feed portfolios. I have more than 130 global patents and patent applications covering specialty ingredients, processing technology, packaging innovations, and biology-based dynamic modeling formulation systems.

Background

Cyber risk is not new to the food and agriculture sector, but the risk of significant business disruption and significant national security threats from cyberattack are growing.[1] Traditional information technology (IT) in the form of email, data storage, records retention, and point of sale activities are ubiquitous and have been for many

[1] Food Protection and Defense Institute. 2019. *Adulterating More Than Food: The Cyber Risk to Food Processing and Manufacturing. https://hdl.handle.net/11299/217703.*

years. These systems are updated regularly with most food firms relying on in-house, or third-party, IT providers to manage cybersecurity for their systems.

The newer cyber risk in the food and agriculture sector is the growing dependence upon cyber-based information and operational technology (OT) systems used to perform an ever-expanding variety of normal operating procedures. The operational technology systems, including industrial control systems and internet-connected sensors, controllers, and devices (sometimes referred to as the internet of things or IoT), manage the most critical aspects of food production, typically have the lowest level of integrated cybersecurity protections, and are often not included in enterprise cybersecurity plans, protections, and training.

Two pieces of operational technology illuminate aspects of cyber risk in the food and agriculture sector. First, a pasteurizer in a fluid milk or juice manufacturing facility is critical to assuring the food safety of those products. The pasteurization time and temperature are controlled by sensors communicating with control systems monitored remotely by food safety professionals. Second, in beef harvest facilities, carcasses must be split into right and left halves prior to further processing. This splitting is increasingly being done by robotic carcass splitters. If either of these pieces of equipment are compromised through a cyberattack, the facility would be required to shut down and economic consequences would result. Depending upon the type of cyberattack and the speed at which it is detected, other consequences may also occur. For example, if the pasteurizer is compromised, it may inaccurately, and possibly even maliciously, report and record that acceptable food safety metrics were reached—even though they were not—resulting in unsafe product being distributed and wide-scale human health harm. Cyberattack on the carcass splitter could result in serious worker injury to human operators present in those areas.

Although the above examples are hypothetical and used to illustrate types of technology at risk of cyberattack, the concept of cyberattack in the food and agriculture sector is not hypothetical. It has been occurring for years and is gaining recognition as a significant threat to business continuity and national security. In fact, Dragos, Inc. reported that ransomware attacks on industrial entities increased more than 500% from 2018 to 2020.[2]

History of Cyber-Attacks in the Food and Agriculture Infrastructure

As early as 1998, cyber criminals targeted the food and agriculture sector with denial-of-service attacks, e-commerce thefts, and intellectual property thefts. However, most of these attacks had limited public exposure to avoid brand damage. The more recent cyberattacks have evolved to compromise networks, disrupt operations, and/or exfiltrate vast amounts of data. The scale of these recent attacks, in terms of ransoms paid and levels of operational disruption due to the significant consolidation across the sector, make such events difficult to keep from the public eye. To make matters worse, the rise of cryptocurrency payments to end the attack and recover data makes it exceptionally hard for law enforcement to identify the criminal organization and track and recover payments.

Since late 2020, major cyber incidents (*e.g.,* SolarWinds, E&J Gallo, Molson Coors, Colonial Pipeline, JBS, Kaseya, and others) have severely disrupted the ability to conduct business for many companies in the food and agriculture sector. With many of these companies paying ransom to end the attack, it is likely that attacks will continue. In addition, the pandemic highlighted how food and agriculture sector consolidation and interdependencies increase not only risk of disruption but also the probability that accompanying publicity will result in increased targeting of food and agriculture sector infrastructure. Ransomware, data theft, and operational disruption are not the only issue. As shown with water treatment facilities in California and Florida, cyberattacks are also intended to harm health. In these attacks, water disinfection chemical levels were adjusted to harmful levels.

Implications of the Growing Cyber Risk in the Food and Agriculture Sector

The food and agriculture sector is incredibly diverse. It is composed of facilities ranging from small businesses and family farms to multinational corporations that produce an infinite variety of foods. Some aspects of the food and agriculture sector are highly distributed, while some are highly consolidated. Each and every business, farm, production facility, and company is individually vulnerable to cyberattack. On a broader scale, however, the food system is one of the most interconnected and interdependent systems within the critical infrastructures. Relationships among food companies can include supplier, customer, and competitor simultaneously. These interconnections often mean that data flows routinely and fluidly across the

[2] Larson and Singleton. 2020. *Ransomware in ICS Environments* (*https://hub.dragos.com/hubfs/Whitepapers/Ransomware in ICS Environments_Dragos 2020.pdf*).

sector. From a cyber perspective, this amplifies the attack surface and the risk. It also amplifies the potential magnitude of system disruption and failure from a cyberattack, including its secondary and tertiary cascading impacts.

The food and agriculture sector is labor intensive. However, a history of labor shortages coupled with technology advancements have driven automation in the sector. The changing worker health provisions and expectations exacerbated by labor shortages during the pandemic have only accelerated the motivation within the food and agriculture sector to increase automation. However, with every advancement comes unintended consequences. With increased automation and the concomitant rise in computational and network complexity, cyber risk also increases.

Regardless of why cyber risk exists, cyberattacks have the potential to cause catastrophic disruption and endanger national security concerns. For example, the recent JBS cyberattack disrupted meat processing operations in several countries and simultaneously caused disruptions to supply chains, logistics, and transportation to customers. And it increased consumer prices. This amplification of disruption can easily result in national security threats depending upon the scale of attack and subsequent disruption.

As a hypothetical example of a national security threat, consider for a moment the impact if both of the only two HDPE pellet plants that produce the gallon milk jug pre-forms were the victims of a simultaneous cyberattack? We know that during Hurricane Katrina when just one of these HDPE facilities was compromised, the supply of fluid milk at the consumer level plummeted to shortage levels in many areas of the country while dairy farmers dumped millions of gallons of milk. A situation, such as this, could be repeated and affect a broad area of the nation in the event of a targeted cyberattack.

Our FPDI research and experience engaging with food system stakeholders led us to identify the following primary (but not exclusive) causes for cybersecurity risk to agricultural and food products supply chains:

- Lack of awareness throughout the sector of the scale of cybersecurity risks to agricultural and food processing and manufacturing and the potential consequences if those risks were realized.
- Lack of regulatory guidance and clarity regarding how cybersecurity risks should be accounted for and addressed in assessing food safety risks.
- Lack of standards for the cybersecurity of agricultural and food processing systems, both for the operation of those systems and for the design and development of the software and hardware that comprise them.
- Lack of research and vulnerability assessment data upon which to make evidence-based cybersecurity risk mitigation and policymaking decisions. This especially hampers the ability to prioritize the most vulnerable products or processes for mitigation efforts.
- Lack of cybersecurity education and training among operations technology personnel and lack of control systems knowledge among information technology personnel tasked with cybersecurity at agriculture and food companies. This is particularly acute at small- and medium-sized businesses.

It should also be recognized that although some food and agriculture sector partners may recognize the risk, constraints exist in their ability to manage that risk. They must balance a multitude of supply chain, food safety, labor, financial, and other operational risks in addition to cyber risk. Not only does managing cyber risk increase operational costs, but there are also very few experts with the knowledge and experience to effectively enhance cybersecurity in the food and agriculture operational environment. This type of expert is often recognized as irreplaceable and are sometimes referred to as 'unicorns' within the food industry. We need to train and field many more of them.

Recommendations for enhanced cyber resilience

Current Federal law (the Food Safety Modernization Act) specifies that covered facilities must establish and implement a food safety system that includes an analysis of hazards and risk-based preventive controls. Regulations promulgated by FDA require a written food safety plan that includes steps for hazard analysis, preventive controls, oversight and management of preventive controls, monitoring, corrective actions, and verification. Few of these steps can be undertaken without information technology, industrial control systems, and internet-based communication systems. Any compromise of these supporting systems jeopardizes implementation of these critical food safety procedures, including the process controls that must be addressed in hazard analysis and protective strategies, as well as others such as product testing and environmental monitoring. In addition, more historical FDA regulations ad-

dress electronic records creation, accuracy, and retention. However, aspects of the food and agriculture sector may not be covered by these regulations (*e.g.,* USDA-regulated food facilities, farm-level production, *etc.*) and none of the current regulations address cybersecurity of the systems required to acquire, manage, and preserve these records.

As provided in the FPDI comments offered in response to "Notice: Supply Chains for the Production of Agricultural Commodities and Food Products, Request for Public Comments", I, as Director of FPDI, recommend the following actions:

- USDA should take the lead in developing new minimum information technology risk reduction regulations and develop new Good Manufacturing Practices (GMPs) specific to the production agriculture and food and beverage industries. These could be developed as a new set of cyber preventive controls to be consistent with the implementation of other Food Safety Modernization Act (FSMA) requirements. This action should be taken in concert with industry, the Department of Homeland Security (DHS), the Food and Drug Administration (FDA), and the Federal Bureau of Investigation (FBI).
- USDA, in collaboration with FDA, should develop sector-specific system risk reduction measures, facility-level cybersecurity risk reduction plans, and operator guidelines and training. They should also develop specific preventive controls training and reporting for cyber systems within the food and agriculture sector.
- USDA should host a series of cybersecurity review and technology forums or similar events for food and agriculture sector senior management to accelerate the education of senior leadership within industry. Senior leadership needs a better understanding of the cyber risks and the importance of investing in risk reduction for cyber systems, especially in the food and agriculture operating environment. This action should occur in partnership with the insurance industry, the cybersecurity industry, FDA, FBI, and DHS,
- USDA should develop a university-based food and agriculture sector focused cyber Center of Excellence to conduct research and education that aids in cyber risk reduction.
- USDA should collaborate with industry and DHS to establish an Information Sharing and Analysis Center (ISAC). The mission of this ISAC should be to understand evolving food and agriculture sector cyber risks as they may impact both individual facilities and entire supply chains, anticipate local and broad supply chain exposures, and monitor cyber technology shifts and emerging cyber-based or control technology risks across all aspects of the food system.

Closing Remarks

Securing the vast cyber-infrastructure and electronic information systems sustaining America's food and agriculture supply system is vital to the economic vitality of the system and our nutritional and national security. If we do not act, we risk the nation's ability to provide a sufficiency of nutrition, the very essence of well-being for our friends, family, colleagues, constituents and institutions.

I, and the Food Protection and Defense Institute, appreciate the opportunity to engage in and contribute to this national discussion of our food system's resilience.

Thank you. I look forward to further discussion on this important topic.

The CHAIRMAN. Thank you very much, Dr. van de Ligt, and we look forward to our opportunity to ask you about what sorts of private-public partnerships we can pursue to reinforce our vulnerabilities against cyberattacks, and that opportunity will come shortly.

Our third witness today is Dr. Keri Jacobs. Dr. Jacobs holds an MFA Chair in Agribusiness, is a graduate of the Institute of Cooperative Leadership Fellows, an Associate Professor of Agriculture and Applied Economics at the University of Missouri, the Show Me State. Her research explores consolidation and catalysts and impacts among Midwest agriculture cooperatives and the benefits of increased supply chain participation by producers, very appropriate for today's Subcommittee hearing.

She received her bachelor of arts in economics—associate degree, excuse me, business administration from Coe College, and a Ph.D.

in economics from North Carolina State University. Again, enjoying the multitude of universities of this wonderful country of ours.

Dr. Keri Jacobs, please open on your statement this morning.

STATEMENT OF KERI L. JACOBS, PH.D., ASSOCIATE PROFESSOR OF AG AND APPLIED ECONOMICS; MFA CHAIR IN AGRIBUSINESS; DISTINGUISHED FELLOW, DIVISION OF APPLIED SOCIAL SCIENCES, COLLEGE OF AGRICULTURE, FOOD AND NATURAL RESOURCES, UNIVERSITY OF MISSOURI, COLUMBIA, MO

Dr. JACOBS. Thank you, Chairman Costa, Ranking Member Johnson, and Members of the Subcommittee. Thank you for the invitation to participate in this discussion regarding producer ownership in our beef supply chain.

As an economist, I believe in the power and elegance of capitalism. The pursuit of profitability through private ownership, private control, and private returns fuels innovation and efficiency. My testimony today is not about the economics of the beef supply chain; however, through cooperation, pricing information exchange, and other market dimensions can be improved and sustained.

In 1922, in response to growing imbalances and tensions in ag, not unlike what we see in here today, Congress authorized producers to form cooperatives, the law known as the Capper-Volstead Act. In doing so, Congress provided a mechanism for producers to have equal footing with the big companies they purchased from and sold to. The requirements of Capper-Volstead are that the co-op be governed by its producer-members, be capitalized by them, and that those producers share in the profitability of those business activities. Those requirements helped co-ops bring discipline to markets. Instead of focusing on short-term profitability, the cooperative transfers the value from the upstream and downstream markets back to its producer-members.

The question this Committee, the Subcommittee, and the industry contemplates is whether producer ownership is a way forward for this industry. You have heard testimony of the significant scale economies that exist in beef processing——

The CHAIRMAN. Pardon me. Could you repeat that one more time?

Dr. JACOBS. Yep. I said—I started with—the question this Subcommittee and the industry contemplates is whether producer ownership is a way forward for the industry. You have heard testimony of the significant scale economies that exist in beef processing, suggesting that small scale processing to commodity markets is unlikely to be sustainable long-term.

Rather than working against scale economies, one option is to support livestock producer ownership to an efficient scale. We do have examples of large-scale producer ownership in pork. Triumph Foods is producer-owned and its structure reflects the characteristics of cooperatives that discipline a market. The producer-owners have long-term contracts to sell hogs, and they effectively earn wholesale meat prices for their animals. Concentration of livestock industry, particularly at the processing stage, seems inevitable from the efficiency lens. Through cooperation, however, livestock producers can flip the script and participating in generating and

receiving the value this efficiency creates. Producer ownership in beef processing is possible, and it has the potential to improve conditions for beef producers in the entire supply chain. When at scale, producer ownership can smooth variability in producer incomes because it allows them to capture income from downstream markets that may be less volatile. More of the value-added income stays in the producers' rural communities and the cooperatives' communities instead of flowing to investors.

To accomplish this, livestock producers must coordinate and commit production via contracting. They likely need assistance in overcoming challenges such as selling byproducts from processing and addressing uniformity in feedstock supplies. I encourage Congress to consider the additional policies and actions that can improve the likelihood of an adoption and success of producer ownership in beef processing, and the successes of livestock producers.

Among these are investments in research to understand minimum efficient scale in beef processing and the producer commitment it will require. Temporarily subsidizing evidence-based scalable capacity, creating a loan guarantee that reduces risk to lenders to beef—excuse me, producer-owned beef finishing, and ensuring financing is available earlier in their investment period, preserving these market products and investments to relabeling laws, and finally, coordinating technical assistance for producers interested in forming cooperatives, helping them gain traction in a start-up period, and helping them as they navigate market coordination with their downstream partners.

I began my testimony by stating my belief in capitalism. Through my work with cooperatives and their producer-members, I do appreciate the collective action model as a workhorse of capitalism in agriculture. Cooperation takes a holistic view of the agricultural supply chain. With temporary assistance and the appropriate policies, producers can work within the parameters of scale and benefit from it. Capitalism through cooperation by producers enables even the small producer to improve his or her economic situation. This form of capitalism can improve economic conditions in rural communities, and it pays attention to the whole supply chain.

Mr. Chairman, thank you for this opportunity to join the discussion. I look forward to your questions.

[The prepared statement of Dr. Jacobs follows:]

PREPARED STATEMENT OF KERI L. JACOBS, PH.D., ASSOCIATE PROFESSOR OF AG AND APPLIED ECONOMICS; MFA CHAIR IN AGRIBUSINESS; DISTINGUISHED FELLOW, DIVISION OF APPLIED SOCIAL SCIENCES, COLLEGE OF AGRICULTURE, FOOD AND NATURAL RESOURCES, UNIVERSITY OF MISSOURI, COLUMBIA, MO

Chairman Costa, Ranking Member Johnson, and Members of the Subcommittee, thank you for this opportunity to testify regarding the potential for producer-ownership in the U.S. beef supply chain. I am an agricultural economist at the University of Missouri. As an extension specialist, I have spent 10 years working closely with producers and the cooperatives of which they are member-owners. My extension work supports the governance roles and financial acumen of cooperative directors and educates producers, students, and the public about cooperatives. My research considers the evolving agribusiness landscape as it relates to consolidation in Midwest agriculture, the challenges facing agricultural cooperatives and producers, the role and value of cooperation, and the benefits to producers as they participate more fully along their supply chains.

As an economist, I believe in the power and elegance of capitalism. The pursuit of profitability through private ownership, private control, and private returns fuels

innovation and efficiency. I also believe that sustainable capitalism must take a holistic view of markets, and this requires competitive markets—where no single entity has undue control or influence on the pricing or availability of a product or service that disadvantages others in the supply chain. An equally important feature of capitalism is market efficiency—where coordination of market activities minimizes costs; permits free exchange of information; and leads to an appropriate allocation of resources, goods, and services. Although my testimony today is not about pricing, concentration, market power, information exchange, or efficiency in the beef supply chain, these are all dimensions that can be improved and sustained through producer-ownership. Cooperatives bring discipline to a supply chain, and this discipline is critical to efficient and competitive markets.

Cooperatives are a special type of corporation. They are distinguished from traditional corporations by their ownership structure, who makes the decisions and how, and who benefits from their activities. Traditional corporations are investor-owned. Investors contribute equity capital privately or buy shares of a company's stock. The value of that investment depends on the corporation's profitability. Investors benefit when the shares of their stock increase in value and when the corporation pays dividends on those shares. The more you invest, the more voting power you have and the more you benefit from the business' success. Investors expect a return on their investment, and management's job is to ensure that. No requirements stipulate that these investors are otherwise linked to the business, and most often they are not. Furthermore, the board of directors—the corporation's governing body—has no requirements to be actively involved otherwise in the supply chain. This creates a situation where the corporation makes decisions in the best interest of its investors by looking at its bottom line. Beyond ensuring that it meets the needs of suppliers and buyers, the business has little incentive to share the benefits of its activities upstream or downstream.

A supply chain—or part of a supply chain—dominated by a few very large, investor-owned firms that pay most attention to their immediate economic needs can become undisciplined and lack sustainability from a holistic market viewpoint. This was precisely the situation our nation, producers and consumers faced in the early 1900s. Producers trying to market and distribute their products were outsized and subject to unfair trade terms and pricing. Congress recognized that the supply chains in grain, dairy, and other critical sectors left producers with too little control, subjected producers to predatory pricing, and distorted the prices that consumers paid. In 1922, in response to the growing imbalances, Congress authorized producers to form associations, or cooperatives, through the law titled "An Act to Authorize Association of Producers of Agricultural Products"—more commonly known as the Capper-Volstead Act. By permitting producers to form associations to collectively process, prepare for market, handle, and market their products, Congress provided a mechanism for producers to have equal footing with the big companies with which they did business. The law did include several requirements. Those requirements, which state statutes governing cooperatives and producer associations subsequently reinforced and enumerated, are embodied in the Principles of Cooperation. Among these are the following:

1. Open and Voluntary Membership: There is no requirement to become a member. Producers participate voluntarily so long as they can use a cooperative's services and accept the responsibilities of membership, regardless of race, age, religion, gender, and economic circumstances.
2. Democratic Member Control: Members actively participate in setting policies and making decisions through a democratic process that is independent of their equity contribution. The cooperative is governed by a board of directors elected by and from among the membership. The board is accountable to those members.
3. Economic Participation: Members contribute capital equitably, and the association operates for the benefit of its members. Profitability is shared with the membership proportional to members' use, and the cooperative can allocate surpluses for growth; reserves; and other activities, including investments in their communities, approved by the membership.

Capper-Volstead created a vehicle for a nearly inextricable link between producers and their supply chains—however far into it they choose to organize *vis-à-vis* cooperation. This structure and its requirements are precisely why we say that a cooperative brings discipline to a market. Instead of focusing on short-run profits, the cooperative seeks to aggregate and transfer the value further along the supply chain back to its producer-members. In contrast to a traditional investor-owned corporation, a cooperative's incentives are aligned with the interests of those who do busi-

ness with it because they are the ones who provide equity capital, make decisions, oversee its operations, and benefit from its activities. Furthermore, those owning, controlling, and benefitting from the business live in the communities in which the cooperative operates. Producer-members have an incentive to ensure that the business acts responsibly in the community.

According to the USDA's 2019 Agricultural Cooperative Statistics Report, more than 1,700 U.S. producer-owned agricultural cooperatives operate more than 9,000 locations in the U.S. and have nearly 1.9 million voting producer-members. You may recognize cooperatives such as Land O'Lakes, Dairy Farmers of America, and Organic Valley—dairy marketing and processing cooperatives that each uniquely provide their producer-members with access to supply chains for dairy and its products. Blue Diamond Growers; Florida's Natural Growers; the Ocean Spray Cooperative; and the National Grape Cooperative Association, which owns the Welch's brand, are composed of independent growers who control and own their respective supply chains from production to product branding to retailing. Hundreds of local and federated grain marketing and input supply cooperatives including Ag Processing (AGP), CHS, GROWMARK, MFA Inc., and Southern States give grain producers sufficient scale to collectively purchase inputs, market their grain, and expand into value-added markets. Producers even participate in financing their own operations and their cooperatives through ownership, governance, and risk- and profit-sharing in financial cooperatives such as the Farm Credit System and CoBank. Each of these cooperatives has succeeded in improving producers' control in the marketplace, facilitating greater coordination, adding value to producers' operations and income through profit- and risk-sharing, and improving their rural communities.

I want to address a common misunderstanding, too, about cooperatives and collective action by producers—that is, that big cooperatives act just like big corporations and eventually seek to maximize their own profitability. A company, even a monopolist, that is owned by producers and required to be governed by those producers and share profits with those producers will still reflect a competitive outcome. This is because the company will allocate its profits back to those producers. Even if the cooperative earns very high margins, it shares the returns with producers proportional to their business. This effectively increases the net price a producer receives for her or his or her output or decreases the price a producer pays for a product or service. Producer-owners decide how and how much of the profitability to allocate and how much to retain for investments in the cooperative's assets, relationships, and innovation that enhance producers' production, efficiency, or competitiveness in value-added markets. This is, again, what I mean when I say that cooperatives are a disciplining factor in markets. Cooperatives reflect the values and needs of their producer-members, and they do so by prioritizing people, communities, and values over maximizing profits.

We do have successful, large-scale producer-ownership in livestock, specifically in the pork industry. Triumph Foods is a producer-owned LLC, and its operation reflects the features of cooperatives I have described. In its model, each producer commits to deliver a specific number of hogs to the plant each year, and producer-members provide a proportionate share of the plant construction cost. Producers are free to deliver surplus hogs to other processors. Meat produced at the plant is marketed by Seaboard Foods, and the producer-owners are paid based on the dollars generated by these wholesale sales. The producer-owners have a long-term contract to sell hogs and effectively earn wholesale meat prices for their animals.

The question this Subcommittee and the beef industry contemplates is whether producer-ownership—through cooperatives or other forms of collective action—can be a way forward for this industry. You have heard testimony about the significant scale economies that exist in beef processing, suggesting that small-scale processing to commodity markets is unlikely to be sustainable in the long term. Country Natural Beef is a cooperative representing more than 90 family-owned ranches in the western U.S. It began in 1986 and is still operating today. The business processes approximately 500 head of cattle per day. The producer-owners collectively engage in custom processing, packaging, and marketing of their beef through local retail stores, and the ranchers capture profits from raising cattle through processing. Every rancher is an owner and serves on the board of directors. Grass Roots Farmers' Cooperative and Buckeye Valley Beef Cooperative are smaller-scale examples of beef processing for niche and value-added markets, and they sell direct to consumers as well. To my knowledge, however, there is currently no large-scale producer-ownership in beef finishing or processing to traditional markets or that can compete with the very large processors. I can only speculate about the reasons for this. Beef processing has significant scale economies due in part to labor intensity and specialization, the enormous up-front capital investment, and the requirement of a predictable daily intake of a consistent feedstock, which I understand has prov-

en problematic due to the diversity in cattle genetics and cattle production's long biological cycle. The sum of these confounding factors is likely why a small, collective-action model has not emerged with long-term success.

There is a path forward that recognizes concentration in beef processing for traditional markets may be inexorable, even preferred, due to the scale economies that exist. Rather than working against scale economies, one option is to support producer-ownership to an efficient scale. A producer-owned supply chain from the cow-calf stage through processing that reaches a profitable minimum efficient scale in terms of per-head margins will have a different outcome in producer profitability than we see today. We need research to understand the minimum scale. Coordination along the supply chain by producers, when done at scale, can smooth variability in producer incomes by capturing income from downstream markets that are less volatile. The income producers and their cooperatives generate will flow to the rural communities where they operate instead of to investors. Importantly, this model places producers closer to consumer markets and allows coordination between consumer preferences and production decisions.

Concentration in the beef industry, particularly at the processing stage, seems inevitable from an economic sustainability lens. Through cooperation, however, producers have an opportunity to flip the script and participate in earning value that this efficiency creates. Beef producers must desire to coordinate and commit production to the effort via contracting. Challenges related to selling byproducts, such as offal and hides, and uniformity of feedstock supply through genetics must be addressed. With this in mind, I encourage Congress to consider five actions that could improve the likelihood of adoption, success, and outcomes of beef producers participating in collective action.

1. USDA invests into research on minimum efficient scale in beef processing and the commitments needed to achieve it.[1]
2. Temporarily subsidize demonstrated or evidence-based scalable capacity.
3. Create a loan guarantee programs that reduce risks to lenders for producer-owned beef finishing, processing, and marketing and that ensure financing is available earlier in the investment period.
4. Preserve niche-market products and investments through labeling laws.
5. Provide technical assistance for producers to form associations or cooperatives, gain traction in the start-up period, and navigate market coordination with downstream partners.

I began my testimony by stating my belief in capitalism. Through my work with cooperatives and the producers who own and control them, I have come to appreciate the cooperative model and collective action by producers as a workhorse of capitalism in agriculture and a way of conducting business that has benefits well beyond private returns to investors. Concentration in the U.S. beef supply chain may be inevitable due to economies-of-scale. In this case, market discipline is critical. With temporary assistance, producers can work within the parameters of scale and benefit from it by utilizing a coordinating model, such as cooperation. This form of capitalism enables even the little guy to participate and improve her or his economic situation. This form of capitalism can improve economic conditions in rural communities. This form of capitalism pays attention to the whole of the supply chain—from producer to consumer. Through collective action, producers have the ultimate incentive to ensure the safety, security, and sustainability of their supply chains. Their livelihood depends on it.

Mr. Chairman, thank you for the opportunity to discuss the potential of producer-ownership in the beef supply chain. I look forward to your questions.

The CHAIRMAN. Thank you very much, Dr. Jacobs, for your very informative testimony, and we will look forward to the Q&A portion.

Our last witness, certainly but not the least, is Dr. Dustin Aherin. Dr. Aherin is an Animal Protein Analyst at Rabo AgriFinance. I think many of us know that Rabo AgriFinance has

[1] A 2013 USDA ERS Economic Research Report (No. 150), "*Local Meat and Poultry Processing: The Importance of Business Commitments to Long-Term Viability*" (*https://www.ers.usda.gov/webdocs/publications/45094/37949_err-150.pdf?v=5131.8*) by Gwin, Thiboumery, and Stillman is a model for this investigation.

a great presence in providing lending activity throughout American agriculture, a well-respected financial institution.

Dr. Aherin within animal protein concentrates his work on beef. Aherin has a unique combination of commercial beef production experience and analytical training. He joined RaboResearch after completing his Ph.D. at the Beef Cattle Institute at Kansas State University, and he also holds a bachelor's and master's degree in animal science from Kansas State. It looks like, Dr. Aherin, you have stayed in Kansas, but good for you, and we look forward to your testimony.

STATEMENT OF DUSTIN AHERIN, PH.D., VICE PRESIDENT, RABORESEARCH ANIMAL PROTEIN ANALYST, RABO AGRIFINANCE, CHESTERFIELD, MO

Dr. AHERIN. Thank you, Chairman Costa, Ranking Member Johnson, and Members of the Subcommittee. Thank you for inviting me to join the discussion today.

As an Animal Protein Analyst for Rabobank, which is engaged across the entire beef supply chain, I assist in strategic decision-making for both the bank and the bank's clients by offering a research-based perspective on fundamental market dynamics and future trends.

Major U.S. beef supply chain disruptions over the past 2 years have sent the cattle and beef industry into uncharted but explainable territory. The imbalance of excess market ready cattle supplies in the face of reduced operational packing capacity has put downward pressure on cattle prices. Meanwhile, consumer demand for beef and all animal proteins has reached record levels. These dynamics, combined with elevated processing costs, have increased the spread between beef price and cattle price, just as economic principles, past research, and historical relationships would suggest. Both the direction and magnitude of the price grid are well within the range of expectation.

The pandemic has created enormous challenges for cattle producers. Seeing the price difference between cattle and beef has only added to the emotional strain. I understand the frustration. I have owned and bred cattle most of my life, and I have friends and family that make a living ranching and feeding cattle. However, with stakeholders that are invested throughout the entire supply chain, from rancher to packer to retailer, I must look at the beef industry from an objective and analysis-based perspective.

First, cattle are not beef. Cattle are one of several inputs in the beef production. Other major inputs include labor, physical capital, and technology. These inputs are always seeking but never finding the perfect balance. This creates cycles. Input imbalances are communicated through prices, whether that is cattle prices, wages, or investments.

In recent years, extreme and unexpected events have severely restricted several of these inputs. Examples include facilities in the August 2019 plant fire and labor during the pandemic. A working market sends price signals to adjust. These same price signals created record high cattle prices and packer losses in 2014 and 2015.

The biology of the beef industry makes it slow-moving and capital intensive. Adjustments take years. While recent unforeseen

events have exacerbated the situation, the foundation for today's circumstances was laid over several decades. Beef packing has historically been a low margin business. In the year 2000, the U.S. harvested nearly 30 million head of fed cattle. By 2015, fed cattle slaughter was under 23 million head. Throughout this period of cattle supply contraction, the most inefficient packing plants were driven out of business as competition for limited cattle supplies drove cattle prices to record highs. From 2000 to 2015, U.S. beef industry experienced a net decline of roughly 14,000 head per day and fed cattle processing capacity. Even before the extremes of 2020, recent margins suggest opportunity to add operational packing capacity; however, that opportunity comes with significant risk. Based on recent new plant announcements in the current environment of high construction costs, the new plant currently costs roughly $200 million for every 1,000 head of daily capacity. Then a new endeavor must meet regulatory requirements, build a labor force, and keep enough cash on hand to absorb losses. Most crucially, it is not just about building facilities. It is about building a business model. To compete against the efficiency of large incumbent packers, new entrants will likely have to build a differentiated premium brand strategy. Differentiated beef requires differentiated cattle. Alternative marketing agreements are the best way to secure a consistent supply of such differentiated cattle. Strong vertical supply chain relationships will be critical to the success of any new beef business.

In response to market signals, numerous plans for greenfield plants or expansions of existing facilities have been unveiled in recent months. If all of the announced plans for plant construction and expansion come to fruition, more than 8,000 head of daily fed cattle capacity could be added to the U.S. beef industry over the next 5 years. Recognizing current drought conditions, if the beef cow herd declines by two percent or less, there is opportunity for about 5,000 head per day of profitable packing expansion.

A note of caution. There is a point where industry capacity goes too far to withstand cyclical periods of tight cattle supplies. Drought risks and cyclical fundamentals must be considered. Additional operational capacity does not solely have to come from new facilities. Increased technology implementation will be critical to success. Recently, many packers have revitalized their focus on technology development. Enlightened by the pandemic to the long-standing labor shortages in the meat industry, startups are also bringing outside expertise to advance technology and automation. One percent improvement in volume efficiency across all existing plants would add 1,000 head of daily fed cattle processing capacity.

2020's cattle backlog is nearly cleared. Year over year cattle prices are already improving, and should continue to do so through the second half of 2021 and beyond. In conjunction with tightening cattle supplies, capacity expansion will come online over the next several years, and new technologies will reduce labor constraints, further shifting margins to the benefit of cattle producers.

In closing, the recent shocks to the beef industry have presented the entire beef supply chain with enormous challenges. The resulting price movements have been frustrating for cattle producers, to say the least, yet these same price movements and supply chain

disruptions have also contributed to the accelerated investment in packing capacity expansion, new technologies, and new business strategies that will help the beef industry adapt and evolve to ever-changing demand, and that is the market at work. Thank you.

[The prepared statement of Dr. Aherin follows:]

PREPARED STATEMENT OF DUSTIN AHERIN, PH.D., VICE PRESIDENT, RABORESEARCH ANIMAL PROTEIN ANALYST, RABO AGRIFINANCE, CHESTERFIELD, MO

Chairman Costa, Ranking Member Johnson, and Members of the Subcommittee, thank you for inviting me to join the discussion today. As an animal protein analyst for Rabobank, which is engaged across the entire beef supply chain, I assist in strategic decision making for both the bank and the bank's clients by offering a research-based perspective on fundamental market dynamics and future trends.

Summary

Major U.S. beef supply chain disruptions over the past 2 years have sent the cattle and beef industry into uncharted, but explainable territory. The imbalance of excess market-ready cattle supplies in the face of reduced operational packing capacity has put downward pressure on cattle prices. Meanwhile, consumer demand for beef and all animal proteins has reached record levels, fueled by pandemic stockpiling, increased and reallocated consumer income, and more recently, restaurant re-openings, not to mention export demand. These dynamics, combined with elevated processing costs, have increased the spread between beef price and cattle price, just as economic principles, past research, and historical market relationships would suggest. Both the direction and magnitude of the price spread are well within the range of expectation.

Like many businesses, the pandemic has created enormous challenges for cattle producers. Seeing the price difference between cattle and beef has only added to the emotional strain. I understand the frustration. I've owned and bred cattle most of my life, and I have friends and family that make a living ranching and feeding cattle. However, with stakeholders that are invested throughout the entire supply chain, from rancher to packer to retailer, I must look at the beef industry from an objective, analysis-based perspective.

First, cattle are not beef. Cattle are one of several inputs into beef production. Other major inputs include labor, physical capital, and technology. These inputs are always seeking, but never finding, the perfect balance between one another. This creates cycles. Input imbalances are communicated through prices, whether that's cattle prices, wages, or investments. Over the past several years, extreme and unexpected events have severely restricted several of these inputs. Examples include facilities in the August 2019 Tyson plant fire and labor during the pandemic. A working market sends price signals to adjust. These same price signals created record high cattle prices and packer losses in 2014 and 2015.

The biology and natural time-delays of the beef industry make it slow moving and capital intensive. Adjustments take years. While recent, unforeseen events have exacerbated the situation, free market signals, economic losses, drought, and the natural cattle cycle laid the foundation for today's circumstances over several decades.

Beef packing has historically been a low margin business. In the year 2000, with a total cattle population of 98 million head, the U.S. harvested nearly 30 million head of fed cattle. By 2014 and 2015, the total cattle population was below 90 million head with 2015 fed cattle slaughter under 23 million head. Throughout this period of largely drought induced beef cow herd contraction, the most inefficient packing plants were driven out of business as competition for limited cattle supplies drove cattle prices to record highs. From 2000 to 2015, the U.S. beef industry experienced a net decline of roughly 14,000 head per day in fed cattle processing capacity.

Even before the extremes of 2020, recent margins suggest that there is opportunity to add operational packing capacity. However, that opportunity does not come without significant risk. First, the up-front cost of a new or expanded plant is extremely expensive. Based on recent new plant announcements and the current environment of high construction costs, a new plant currently costs roughly USD 200m for every 1,000 head of daily capacity. Then, a new endeavor must meet regulatory requirements, build a labor force, and keep enough cash on hand to absorb losses.

Most crucially, it's not just about building facilities, it's about building a business model. Competing in commodity cattle markets against the efficiency of large, incumbent plants would be extremely difficult for a new entrant. However, if a new entrant can capitalize on a differentiated branding strategy, the premium compo-

nent may be enough to offset efficiency disadvantages. Differentiated beef requires differentiated cattle. Alternative marketing agreements are the best way to secure a consistent supply of such differentiated cattle. Strong, vertical supply chain relationships will be critical to the success of any new beef business.

In response to the described market signals, numerous plans for greenfield plants or expansions of existing facilities have been unveiled in recent months. These plans come from new entrants, minor incumbents, and major incumbents alike. If all of the announced plans for plant construction and expansion come to fruition, more than 8,000 head of daily fed cattle capacity could be added to the U.S. beef industry over the next 5 years. Recognizing current drought conditions, if the beef cow herd declines by 2% or less, there's opportunity for about 5,000 head per day of profitable packing capacity expansion.

A note of caution. There is a point where industry capacity expansion goes too far to withstand cyclical periods of tight cattle supplies. The long-term cattle cycle, drought risks, and market fundamentals must be considered.

I want to emphasize that additional operational capacity does not have to come solely from new facilities. Whether in new or existing plants, increased technology implementation will be a critical component of future success. Recently, many packers have revitalized their focus on technology development as a means to address labor challenges, manage processing costs, and reduce product waste. Enlightened by the pandemic to the long-standing labor shortages in the meat industry, many startups are also bringing outside expertise and perspectives to advance technology and automation in the meat supply chain. Even a one percent improvement in volume efficiency across all existing plants would add 1,000 head of daily fed cattle processing capacity.

With any luck, we will work through the long tail of 2020's cattle backlog in Q3 2021. Year-over-year cattle prices are already improving and should continue to do so through 2H 2021 and beyond. In conjunction with tightening cattle supplies, capacity expansion will come online over the next several years and new technologies will reduce labor constraints, further shifting margins to the benefit of cattle producers.

In closing, the shocks to the beef industry over the last couple years have presented the entire beef supply chain with enormous challenges. The resulting price movements have been frustrating for cattle producers, to say the least. Yet, these same price movements and supply chain disruptions have also contributed to the accelerated investment in packing capacity expansion, new technologies, and new business strategies that will help the beef industry adapt and evolve to ever changing demands. That's the market at work.

Beef Production is a Balancing Act

Before advancing the conversation, it's important to note the difference between cattle and beef. In a simple equation form, a recipe if you will, beef can be represented as the output from the combined inputs of cattle, human labor, physical capital (*e.g.,* facilities), and technology.

Beef = Cattle + Labor + Physical Capital + Technology

The inputs of this equation are always seeking, but never finding, the perfect balance between one another. Input imbalances are communicated through prices, whether that's cattle prices, wages, or investment/divestment in physical capital and technology. As expected in commodity markets, whether it's natural gas or cattle, the over-expansion/over-contraction and subsequent price signals responding to imbalances generate cycles (*e.g.,* the cattle cycle). If any two inputs in the beef production equation are unbalanced, either the limiting input has to expand or the surplus input has to contract. For example, packing capacity (facilities, labor, technology) expands, or cattle numbers decline. Often, it's cattle numbers that are the most responsive to imbalance. Between the two possibilities, the decision to retain or sell a few head comes much easier for the multitude of cow-calf producers than the high-risk, capital-intensive, regulatory-complex endeavor of packing capacity expansion.

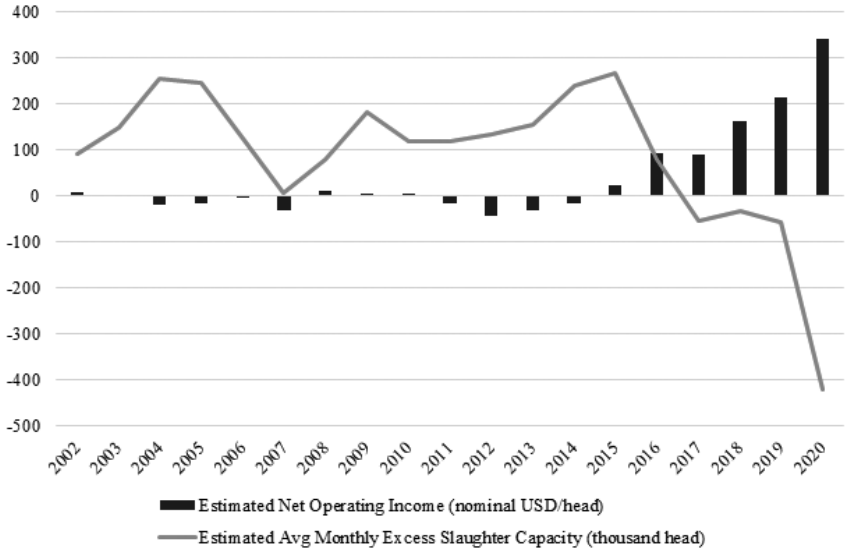
Historical Perspective

Beef packing has historically been a low margin business (*see Figure 1*). Precise estimates of individual company performance are extremely challenging with publicly available, industry average data, but estimates can get close and identify trends. Based on the estimates shown in *Figure 1,* beef packers averaged an annual loss of USD 11 per head from 2002 to 2014. In the year 2000, with a total cattle population of 98.2 million head, the U.S. harvested 29.6 million head of fed cattle (*see Figure 2*). By 2014 and 2015, the total cattle population was below 90 million head with 2015 fed cattle slaughter at only at 22.7 million head. Throughout this

period of largely drought induced beef cow herd contraction, the most inefficient packing plants were driven out of business as competition for limited cattle supplies drove cattle prices to record highs. From 2000 to 2015, the U.S. beef industry experienced a net decline of roughly 14,000 head per day in fed cattle processing capacity. Today's *maximum* U.S. fed cattle processing capacity (no absenteeism, no equipment breakdowns, flawless logistics, *etc.*) is estimated at just above 100,000 head per day.

The remaining plants are those that have best managed operating costs through optimal geographic location, supply chain relationships (both suppliers and customers), and economies-of-scale. However, as cattle herd expansion has outpaced packing capacity and shifted the balance of the beef production equation, packers have been strategically positioned to capture record margins in recent years. This shift was well in place in the years prior to the pandemic. The Tyson-Holcomb fire and [COVID]–19 only magnified the shift by creating acute and unexpected massive imbalances between cattle numbers and suddenly limited availability of labor and/or facilities. As of mid-June 2021, beef packers are still struggling to utilize more than 90–92% of daily capacity as a result of labor shortages and additional [COVID]–19 precautions, even in the face of ample cattle supplies.

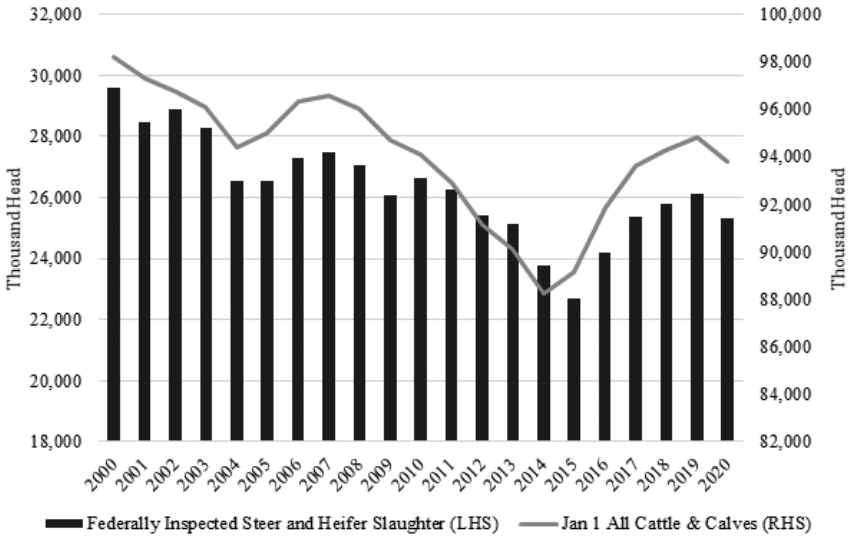
Figure 1. Estimated annual beef packer operating income per head and estimated annual average monthly excess fed slaughter capacity, 2002–2020



Note: Operating income = (cutout value + by-product value) − (cattle purchase cost + estimated processing cost). Estimated monthly capacity is the maximum federally-inspected steer and heifer slaughter for a given month over the previous 3 years, except for 2020, during which [COVID]–19 related impacts and cattle backlogs were considered.

Source: USDA NASS, USDA AMS, LMIC, Rabobank 2021.

Figure 2. Annual Fed Cattle Slaughter and Total Cattle Inventory, 2000–2020



Source: USDA NASS, LMIC, Rabobank 2021.

The Relationship Between Cattle and Beef Prices

Packers are margin operators. Thus, operating costs influence the spread between cattle and beef prices, as packers attempt to capture some profit above operating costs. As operating costs increase, packers will attempt to pass some of those costs to their suppliers or customers, depending on who has the most leverage in the negotiation. This is no different than cattle feeders adjusting their feeder cattle bids based on feed prices and expected fed cattle prices.

The relationship between fed cattle prices and beef prices is also driven by the relative balance between fed cattle supply and operational fed cattle processing capacity (the capacity actually achievable given labor conditions, equipment function, weather, and logistics). The greater the fed cattle supply in relation to processing capacity, the greater the spread between cattle prices and beef prices. In such a scenario, packers don't have to compete as aggressively to buy cattle, and cattle feeders are more willing sellers because packers can more easily find cattle elsewhere to meet their needs.

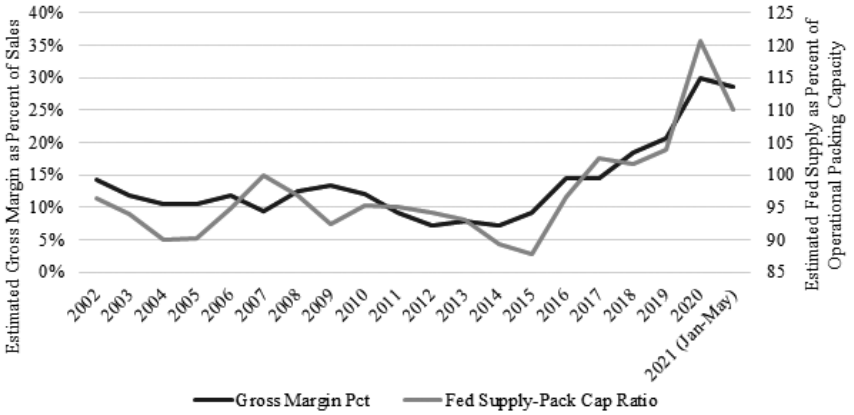
Throughout the pandemic, packers simply haven't had the operational ability to harvest all of the cattle ready to be marketed. While record strong beef demand in both domestic and international markets and, at times, a limited beef supply have driven up beef prices, the bottleneck in packing capabilities has prevented that demand from being transmitted to the cattle sector. Beef cattle value is dependent on the ability to transform cattle into beef. The impacts of both the pandemic and the Holcomb, KS, plant fire severely constrained this transformation. A limited resource, in this case operational packing capacity, will be rationed to those willing to give up the most to access and incentivize that resource. On one end of the supply chain that means paying high prices for beef, while on the other, that means accepting a lower price for cattle. Under such extreme circumstances, cattle price could even be interpreted as how much cattle feeders were willing to pay (*i.e.,* receive a lower selling price) to get an available harvest slot and clear their cattle backlog.

Increased beef demand, which translates to a higher price for the same quantity of available beef, also seems to contribute to higher packer margins. Using quarterly data from 2002 through 2019, a structural supply and demand model was developed, representing the cow-calf, cattle feeder, and packer segments, along with consumer beef demand. The results indicate that a 1% increase (decrease) in wholesale beef price (comprehensive cutout) is associated with a 0.8% increase (decrease) in fed steer price. Upon inserting 2020's market conditions into the model, accounting for consumer beef demand, fed cattle supplies, and operational packing capacity, it was predicted that the average spread between wholesale beef price and dressed fed steer price would increase by USD 25 per cwt *vs.* 2019. The actual price spread in

2020 increased by USD 26 per cwt compared to 2019. This model does not account for the increased operating costs due to [COVID]–19 impacts, which would be expected to further increase the predicted gross margin.

Packer gross margin as percent of sales revenue has also behaved within the realm of expectation. From 2002 to 2019, the correlation between annual estimated packer gross margin percent and annual estimated ratio of fed cattle supply to operational packing capacity was +0.73 (*see Figure 3*).

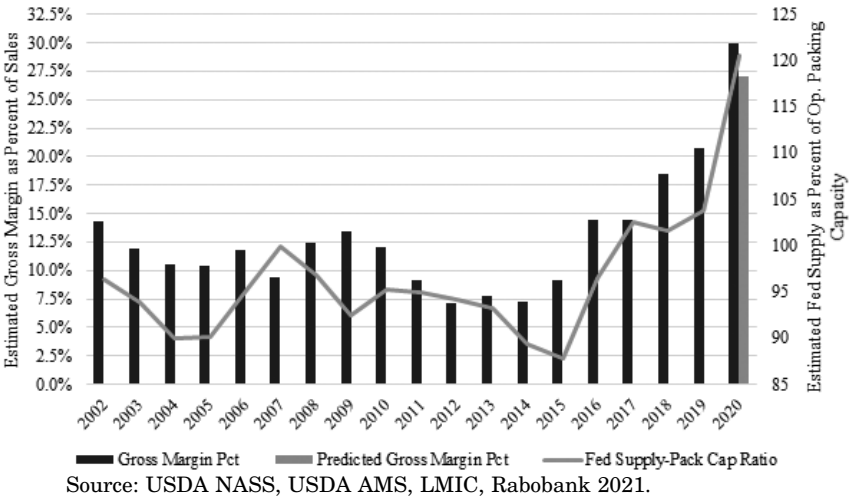
Figure 3. Estimated U.S. beef packer gross margin as percent of sales and estimated fed cattle supply as percent of operational packing capacity



Source: USDA NASS, USDA AMS, LMIC, Rabobank 2021.

A simple linear regression model to predict packer gross margin based on the ratio of fed cattle supply and operational packing capacity using the 2002 through 2019 data was estimated. When the resulting equation is applied to the estimated ratio of fed cattle supply to operational capacity for 2020, the predicted packer gross margin for 2020 is 27% (*see Figure 4*). The calculated packer gross margin based on USDA market data was 30%. Again, this analysis does not account for the increased operating costs due to [COVID]–19 impacts, which would be expected to further increase the predicted gross margin.

Figure 4. Predicted 2020 U.S. beef packer gross margin as percent of sales



Source: USDA NASS, USDA AMS, LMIC, Rabobank 2021.

In both of the exercises described above, it's important to note that 2020 data was not used to train the models. Supply and demand relationships present in the beef

industry prior to 2020 were used to estimate price relationships in 2020 with very respectable accuracy. This provides evidence that the same market relationships that were in play when packers were losing money in the early 2010s were also at play during 2020. Based on the conditions of the market in 2020, the spread between beef and cattle price has responded well within the bounds of expectation in both direction and magnitude.

Meeting Consumer Demand

All beef industry value originates with consumers. Over many decades, centuries perhaps, consumers have increasingly demanded high volumes of high quality, consistently supplied, safe, and affordable food. The food supply chain, from retailers and distributors all the way to producers, has evolved to meet these demands through improved quality, safety, and production efficiencies. The beef supply chain is no exception.

There is a small, but growing segment of consumers who place a high priority on sourcing food directly from primary producers or attach significant value to other specific food attributes. The market is naturally evolving to meet these preferences. However, for the vast majority of consumers, price, taste, and safety are still the most important factors.

The use of economies-of-scale to increase production efficiency and reduce production costs motivated the mid- to late-20th century investment in larger packing plants and consolidation into larger meat packing companies. It also stands to reason that larger beef packing companies can better serve large customers, such as retailers and distributors, who have also grown in size in recent decades. It is worth noting that beef industry concentration has not changed meaningfully in the past 25 years, while beef and cattle prices have fluctuated dramatically based on market fundamentals.

Cattle feeders and packers have turned to contractual agreements, defined as alternative marketing agreements (AMAs), to reduce marketing costs, supply chain risks, and increase capacity utilization, which reduces per head operating costs for both packers and cattle feeders. The inventory management offered by AMAs also helps improve the consistency of beef delivered to consumers by allowing fed cattle to be marketed in a more dependable and timely manner.

Furthermore, AMAs offer convenient implementation of value-based, post-harvest marketing, which directly incentivizes and helps improve beef quality. Over the past 15 years, the share of beef grading Choice or Prime has increased from 55 percent to more than 80 percent. Improved beef quality and consistency grow consumer beef demand.

Mandates Have Costs and Major Risks

If the government mandated a certain percentage of negotiated spot (cash) transactions between cattle feeders and packers, there is an exceptionally high likelihood that cow-calf producers would receive a lower price for their cattle. Cow-calf producers would bear the greatest burden of the negative impacts because they are primary suppliers rather than margin operators (*i.e.,* there's no other market participant further upstream to pass the burden to).

Government intervention into how cattle are marketed does not change the market fundamentals described above and thus will not improve cattle prices. Price discovery in some form or fashion is necessary in any market. It is possible that increased negotiated cash transactions could improve price discovery, but improved price discovery does not mean a better price. Price discovery means that we get closer to the "true", fundamentally driven market price. That "true" price could be better or could be worse. We have no way of knowing exactly what that "true" price is. We can only estimate it based on market dynamics of supply and demand, such as those described above. And based on those dynamics, recent beef to cattle price spreads have been well within the range of expectations.

In this context, a comparison of 2014 and 2020 is noteworthy. In 2014, weekly cash transactions averaged 22.9 percent of all fed cattle transactions. In 2020, that measure was nearly identical at 22.5 percent. The annual average live fed steer price was USD 154 per cwt and USD 108 per cwt for 2014 and 2020, respectively. The difference was fed cattle supply relative to operational packing capacity. In 2014, estimated market-ready fed cattle represented only 89% of operational capacity. In 2020, estimated market-ready fed cattle represented 120% of operational capacity.

It has been suggested that mandating increased cash trade will bring more bids to the open market, increasing competition and increasing cattle prices. If all else stays equal, increased bids would be expected to increase price. But it is almost certain that all else will *not* stay equal. For both cattle feeders and packers, AMAs re-

duce marketing costs and reduce supply chain risks, while increasing capacity utilization, which reduces per head operating costs for both packers and cattle feeders. Increasing cash trade would do the opposite. As packer operating costs increase, they will decrease the price they pay for fed cattle. Again, this is no different than cattle feeders reducing their bids for feeder cattle when corn price increases. All told, it is very possible that the net effect of mandating increased cash trade could decrease cattle price while also increasing marketing costs and inventory risks for cattle feeders. Because cattle feeders are also margin operators, increased costs, increased risks, and lower fed cattle prices would ultimately result in cattle feeders paying less for feeder cattle and calves.

All of the above points are supported by an immense body of economic research literature, as well as my own personal research. The most comprehensive research to-date on the topic of fed cattle transaction type and potential market power is the "GIPSA Livestock and Meat Marketing Study—Volume 3: Fed Cattle and Beef Industries Final Report" (RTI, 2007), which was commissioned by the USDA, authored by 16 economists from public institutions and nonprofit organizations, and peer-reviewed by multiple anonymous reviewers. Both market participant interviews and quantitative analysis conducted as part of RTI (2007) support the conclusions stated above. While the cattle and beef industry have continued to evolve since 2007, to my knowledge there is no published research that contradicts the full production system impacts that were estimated in RTI (2007).

Keeping the Future in Mind

There is always opportunity to learn, adapt, and improve industries. However, it is important that today's "solutions" do not inhibit tomorrow's progress. Allowing markets the flexibility to adjust to a changing world and consumer is imperative.

Price discovery is necessary for any market, but the source of price discovery can change. While the negotiated spot market currently serves as the primary base price reference for fed cattle formula transactions, other species, swine in particular, have shown that wholesale meat prices (pork cutout value) and futures prices can also serve as reference prices. In some cases, base price for hog formulas is calculated as a combination of negotiated spot, pork cutout, and/or futures price. If cattle producers truly want cattle prices to more closely reflect consumer demand, it may make sense to price cattle based on transactions that occur closer to the consumer (*e.g.,* meat prices) rather than farther away (*e.g.,* negotiated cash). It's important to note that all reference prices have advantages and disadvantages.

AMAs will play a critical role in the market of the future. Consumer, investor, and government demand has positioned sustainability as a major and growing focus across all of agriculture. Marketing beef in grocery stores and restaurants based on sustainable cattle and beef production practices has already begun. Given the sustainability goals of major beef and food companies, beef brands centered around sustainability will continue to grow. Verifying and tracing sustainable production practices throughout the entire beef supply chain and guaranteeing a supply of cattle that meet sustainability standards for a particular brand require information sharing and supply coordination between market participants. As already discussed, one of the best ways to coordinate supply chains and incentivize demanded traits is the use of AMAs or other contractual agreements.

The Opportunity for Packing Capacity Expansion

Even before the extremes of 2020, recent margins suggest that there is opportunity to add packing capacity. However, that opportunity does not come without significant risk. Escalating drought conditions coupled with a currently contracting cow herd foretell of cyclically tighter cattle supplies over the next few years.

Several considerable hurdles must be addressed by both incumbents and new entrants to achieve success regarding new capacity. First, the up-front cost of a new or expanded plant is extremely expensive. Based on recent new plant announcements and the current environment of high construction costs, a new plant currently costs roughly USD 200m for every 1,000 head of daily capacity. Putting together and allocating that kind of capital is not a simple exercise, particularly for a potential newcomer.

Second, it's challenging to compete with the established supply chain networks, markets, and efficiencies of existing plants, even if a new plant were opened by one of the large incumbent packing companies. Not only have major packers achieved economy of scale, but most all have also achieved economy of scope. Packers are increasingly involved in value-added processing that targets specific customers, such as case-ready retail cuts or ground beef products. Most existing plants already proved their competitiveness and fitness for survival when the last cattle cycle

forced less-efficient plants out of business in the early and mid-2010s. It's not just about building a facility, it's about building a business model.

Third, the packing sector has been facing labor challenges for years. Building a skilled and dependable work force in what may likely be a region that already has a packing plant presence will be a formidable task.

Finally, the capital depth and longevity required to build and maintain a new plant through its first cattle cycle precludes most would-be investors from considering such a project. If a packing plant project is initiated at peak cattle numbers when packing margins look favorable, it's likely that the cattle cycle would turn over in the multiple years required to build the plant, meet regulatory requirements, and start harvesting and that the new plant would have to operate with tight cattle supplies and negative profit for its first few years of business. That's not a recipe for thin capital or weak hearts.

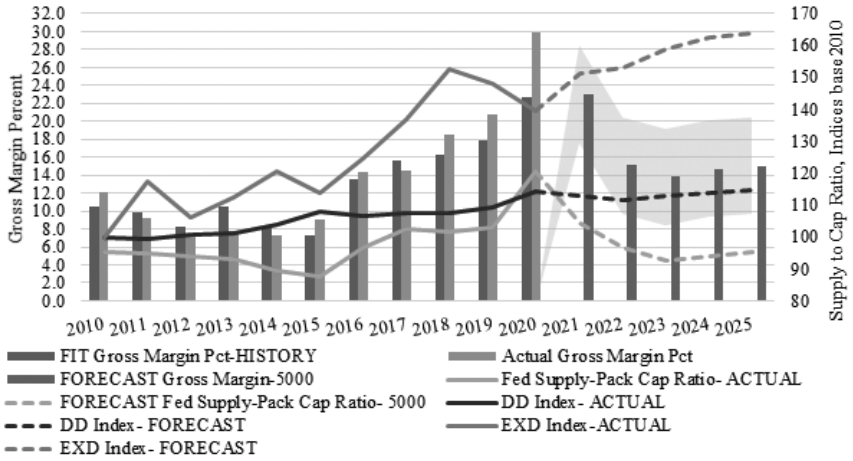
Beef Packing Plant Gross Margin Outlook

Figure 5 and *Figure 6* apply a model that includes the fed supply to operational packing capacity ratio, percent of weekly slaughter on Saturday (which accounts for the strain being put on employees and facilities), U.S. domestic beef demand, and U.S. export beef demand to predict beef packer gross margin as percent of sales. Both figures assume a 5,000 head per day expansion in total industry operational packing capacity by 2023. The key difference is beef cow inventory.

With the Jan[.] 1, 2021 beef cow inventory at 31.2 million, *Figure 5* assumes that beef cow inventory bottoms at 30.5 million head in 2023. *Figure 6* assumes that beef cow inventory bottoms at 30 million head in 2023. *Figure 5* forecasts gross margin to return to levels similar to 2016 and 2017. However, the gross margin forecast for 2023 in *Figure 6* is 2.5 percentage points below the same year in *Figure 5* and dangerously close to the unprofitable early 2010s.

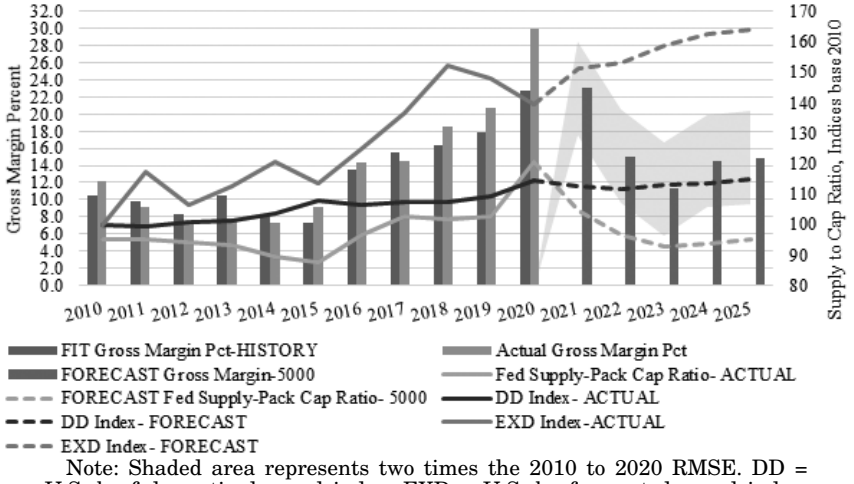
Predicting the future is hard. The point of this exercise is to illustrate that if the beef cow inventory only declines moderately, 5,000 head per day of new packing capacity should have relatively favorable conditions to initiate operations. If the beef cow inventory declines sharply, the first few years of new capacity could be incredibly challenging from a profitability perspective.

Figure 5. Forecast of U.S. beef packing gross margin percent assuming total industry operational packing capacity expands by 5,000 head per day by 2023 and U.S. beef *cow inventory declines to 30.5 million head in 2023*



Note: Shaded area represents two times the 2010 to 2020 RMSE. DD = U.S. beef domestic demand index, EXD = U.S. beef export demand index.
Source: USDA NASS, USDA AMS, LMIC, Rabobank 2021.

Figure 6. Forecast of U.S. beef packing gross margin percent assuming total industry operational packing capacity expands by 5,000 head per day by 2023 and U.S. beef *cow inventory declines to 30 million head in 2023*



Note: Shaded area represents two times the 2010 to 2020 RMSE. DD = U.S. beef domestic demand index, EXD = U.S. beef export demand index.
Source: USDA NASS, USDA AMS, LMIC, Rabobank 2021.

Industry Response

(1) New construction and expansion

In response to the economic signals being sent from the imbalance of cattle supplies and operational packing capacity, numerous plans for greenfield plants or expansions of existing facilities have been unveiled in recent months. These plans come from new entrants, minor incumbents, and major incumbents alike. If all of the announced plans for plant construction and expansion come to fruition, 8,000 to 9,000 head of daily fed cattle capacity and more than 2,000 head of daily non-fed capacity could be added to the U.S. beef industry over the next 5 years.

Most all of the greenfield construction or new entrant plans are small to medium sized (500 to 1,500 head/day capacity), supply chain coordinated, and focused on product differentiation premiums. If these smaller plants are going to compete with the efficiency, economic scale, and scope of the large incumbents, they will have to be successful in these supply chain relationships and product differentiation. Differentiated beef requires differentiated cattle. The best way to secure a consistent supply of such program cattle is through alternative marketing agreements. Not only are cattle supply relationships critical, but strong relationships with buyers (for every piece, not just the high-value cuts) are critical. Again, entering the meat packing space is not just about building a facility, it's about building a business model.

Current consumer and investor trends suggest that moving forward there's real opportunity for beef companies with traceable, well-informed, coordinated supply chains that can verify production practices and differentiate product on more than just eating quality. Thriving export markets and growing export opportunities also point to ever growing demand for U.S. beef. Many of the current plans to build new capacity are a long way from realization with many of the previously described challenges yet to be tackled.

Local lockers and 'micro-plants' have a place in direct-to-consumer marketing and can play an important role in rural communities, however they simply don't offer enough scale to make a measurable, industry-wide impact in the balance of cattle numbers and packing capacity. That said, with the proper business model, they can offer great opportunities for some operations.

(2) Technology

Additional operational capacity does not have to come solely from new facilities. Whether in new or existing plants, increased technology implementation will be a critical component of future success. Recently, many packers have revitalized their focus on technology development as a means to address labor challenges, manage processing costs, and reduce product waste. Enlightened by the pandemic to the long

standing labor shortages in the meat industry, many startups are also bringing outside expertise and perspectives to advance technology in the meat supply chain.

Maintaining necessary skilled labor has long been a challenge for packers. [COVID]–19 has magnified labor challenges and revealed the necessity of additional employee safety measures. Although hazard bonuses, additional sick leave, and other costs most directly associated with the pandemic will diminish with time, many additional labor costs associated with employee well-being, including base wages, benefits, and in-plant safety measures will persist into the future.

As the packing plants of the future gradually become more automated, efficiency will improve and throughput volatility will decrease. Operating hours may also become less restrictive, particularly if technology allows for a smaller Saturday workforce. While increased automation in carcass breakdown and fabrication is certainly a long-term goal, improved production-line data collection and machine monitoring have the most near-term promise. Increased real-time production-line monitoring will help identify choke points and inefficiencies while preventing breakdowns and the introduction of foreign material. Estimating current industry daily fed slaughter capacity at roughly 100,000 head, even a one percent improvement in efficiency across all existing plants could add 1,000 head daily fed cattle capacity. The final result will be an inherent increase in operational capacity at existing plants. However, these changes will take time.

A Note of Caution

As already described, current market fundamentals suggest that for those willing to take the capital risk and do the work to build a viable, competitive business, today may offer the best opportunity in decades to expand packing capacity. Yet, there is a point where industry capacity expansion goes too far to withstand cyclical periods of tight cattle supplies. Support for new packing capacity that is given too freely, without enough private risk, and with disregard to long-term market fundamentals, may invite over-expansion, putting all market participants in jeopardy, particularly new entrants.

Cattle Producer Risk Management

Supply chain disruptions presented challenges for all producers, and risk management goals and outcomes vary depending on the individual producer and the strategy implemented. That said, a general conclusion is that risk management strategies performed as expected, or perhaps even better than expected considering the record positive basis during the periods of the most extreme market uncertainty and price declines, and effectively protected prices for those producers who had risk management plans in place.

CME Group offers both futures and options contracts for Live Cattle and Feeder Cattle. While continuous monitoring for potential improvements and changes is necessary, Live Cattle futures and options contracts in their current form are used extensively as risk management tools.

Using Feeder Cattle futures and options can be more challenging. Compared to Live Cattle, Feeder Cattle futures basis has more seasonal and regional variability resulting from seasonal and regional variability in supply of and demand for feeder cattle. For some contracts, the often strong seasonal price appreciation from initial trading to expiration precludes some producers from using feeder cattle futures as a risk management tool. There is also consistently lower volume in Feeder Cattle futures trade. Combined, these factors can limit the use of Feeder Cattle futures.

Livestock Risk Protection (LRP) offers a viable alternative to using commodity futures for risk management, particularly for calves and feeder cattle. Whereas commodity futures contracts have a fixed contract size, LRP's head count flexibility is an attractive feature. With major changes to LRP in recent years, including expanded head count limits, increased premium subsidies, and allowing premium payments to be made at the end of the coverage period, even producers who considered, but decided against implementing the product in the past may find the new specifications more accommodating. LRP can be a reasonable option to protect producer revenue in the case of a general market decline and may be particularly attractive to small to mid-sized producers or producers who are less familiar with or do not care for the attributes of commodity futures.

Forward contracts often utilize futures contracts as well. In many, or probably most cases, forward contracts establish basis at contract initiation and allow producers to lock-in a selling price based on the futures contract that is nearest, but not before the agreed upon cattle delivery period.

In general, risk management tools, used individually or in combination, can be used to achieve two different goals: to either "lock-in" a price or price window, or protect a producer from a price move in the undesired direction (price decrease if

a seller, price increase if a buyer). It is important to note that risk management does not guarantee profitability, but it can decrease uncertainty and help prevent catastrophe. While each risk management tool offers unique advantages and disadvantages, many cattle producers have effectively employed the currently available suite of risk management tools. Such risk management tools encompass not only cattle prices, but feedstuffs, such as corn futures and USDA's Pasture, Rangeland, Forage (PRF) insurance program.

Producer Education

Producer education is key to cattle and beef industry success, and university extension programs have a critical role to play. Evaluating current extension programs, practices, and funding for opportunities to revitalize producer outreach, improve effectiveness, and better fit communication strategies with 21st century technologies is necessary and would be an extremely worthwhile endeavor. The wide array of responsibilities faced by beef producers, particularly small and medium-sized owner-operators, often means that financial assessment, business strategy, and risk management take a backseat to immediate animal husbandry demands. Cow-calf producers in particular would benefit from risk management education efforts. The importance of consistent, thorough, and applicable producer education, particularly surrounding business management and risk management, cannot be overstated.

Price Spreads Will Narrow

The biology and natural time-delays of the beef industry make it slow moving and capital intensive. Adjustments take years. Total U.S. cattle numbers peaked in 2019 at 94.8 million head and will likely contract for another couple years. If not for the pandemic disruptions, cattle supplies and packing capacity would already be much better aligned. In such a "No-[COVID]" scenario, current packer gross margin percent would likely be closer to 2018 levels, 18%, rather than today's 30%.

With any luck we will work through the long tail of 2020's cattle backlog in Q3 2021. Year-over-year cattle prices are already improving and should continue to do so through 2H 2021 and beyond. In conjunction with tightening cattle supplies, capacity expansion will come online over the next several years and new technologies will reduce labor constraints, further shifting margins to the benefit of cattle producers.

Markets At Work

The shocks to the beef industry over the last couple years have presented the entire beef supply chain with enormous challenges. The resulting price movements have been frustrating for cattle producers, to say the least. Yet, these same price movements and supply chain disruptions have also contributed to the accelerated investment in packing capacity expansion, new technologies, and new business strategies that will help the beef industry adapt and evolve to ever changing demands. That's the market at work.

The CHAIRMAN. Well, thank you very much, Dr. Aherin, and basically what you are saying is what has always proven true, and that is necessity is the mother of invention, and that in terms of the changes that have occurred in the food supply chain, the necessity of the combination of factors that we have outlined this morning have resulted in innovation and changes within the beef cattle market industry.

All good testimony, folks, and now, we will get to the opportunity for Members to ask questions in your allotted time. I conferred with the Ranking Member here. It is the chair's wish, if we can make it work, and we will try to make it work, that when votes are called we will continue to go, and people go and come back. We have three votes, supposedly.

The list that I have here among Members who wish to speak and ask questions on the Democratic side: Axne, Rush, Craig, Hayes, and Spanberger. On the Republican side: DesJarlais, Kelly, Bacon, Baird, Mann, Feenstra, Moore, Hartzler, Rouzer, and possibly LaMalfa, who is participating. That is the list I have in the order it has been given to me.

So, with that said, let me begin my questions.

Dr. Lusk, as you know, we have had in the West drought-stricken challenges that we have been faced with. Ranchers and farmers, dairymen and -women have been impacted by these droughts. Eighty-five percent of the respondents rated selling out portions of their herd or flocks as prevalent or higher in their area. Can you talk about how the extreme drought has impacted, along with wildfires in the western United States, including California that we are experiencing right now, and how it might impact the beef supply chain and cattle markets?

Dr. LUSK. Sure. I think for those folks that are experiencing drought, it is an extraordinarily difficult position, and it is one of the factors that leads to these cycles that I think I alluded to, also Dustin, I believe alluded to as well, that some of that liquidation that is happening now is going to have repercussions 3 or 4 years from now.

Unfortunately in some cases bad news for people in the West is good news for people in other parts of the country, because it will eventually lead to some higher prices as there are fewer supplies in the market. Fewer cattle on the market will support future prices.

I think it is a very difficult time. It does suggest, to me, to protect against weather-related risks and price-related risk, and I think there are a number of tools available to producers to help protect, at least somewhat, against those adverse situations. I think it also speaks to the need to understand some of the impacts of climate change on the industry, and think about research and technology science that can be used to help producers adapt to and be more resilient in the face of some of these changing weather conditions.

The CHAIRMAN. Thank you.

Members, I initiated a letter that many of you signed to Secretary Vilsack that urged the USDA to take a stronger role in helping food and agriculture industry bolster their cybersecurity and better respond to cyberattacks.

[The letter referred to is located on p. 61.]

The CHAIRMAN. Dr. van de Ligt, I would like you to comment. In your testimony, you referenced an alphabet soup of government agencies and some tied to cybersecurity. Can you comment on how the interagency is working together or should be working together? Too often I think we operate in silos that really aren't helpful to ensure that our Federal Government as a whole, as well as the industry, are better prepared to fight cyberattacks as a whole. And I would like your comments on the recent efforts that we have experienced on the payoffs of ransomware, and whether or not that should be encouraged or discouraged, and your thoughts on that. Dr. van de Ligt?

Dr. VAN DE LIGT. Great, thank you. A couple questions there.

Within the food sector, the alphabet soup of agencies, USDA, FDA, DHS, FBI, they all play a role. Part of that is because of the way that food is——

The CHAIRMAN. Are they talking to each other?

Dr. VAN DE LIGT. I am. Can you hear me?

The CHAIRMAN. No, no, I said are these alphabet of agencies talking to each other? I know you are talking to us.

Dr. VAN DE LIGT. I am sorry. They do. They do, Chairman Costa. So, there is a food and agriculture critical infrastructure government coordinating and sector coordinating council, and so, there is communication at that level. They do talk, but there are still some inefficiencies in that. One of the reasons that we recommended that USDA take the lead, particularly with cybersecurity, is because they have more influence across the broader set of agriculture, particularly pre-harvest. But it is really important that they continue this collaboration and this communication.

DHS and FBI are two interesting ones that come in. DHS, from a national security perspective, as you alluded earlier, food supply is actually a national security issue, and so, they bring a different influence and a different view to the table. FBI, particularly in the cybercrime arena, is really important.

But we also can't forget our private-sector partners, because they are the ones that are going to be doing much of the work. And so, this collaboration and this communication through—and I think we can begin it and continue to implement it through the GCC and SEC—but we should also take into account the Congressional actions that have already taken place. So, for example, the Food Safety and Modernization Act (Pub. L. 111–353) actually has an infrastructure—a legal infrastructure in order to—that could be leveraged to move cyber defense forward in the food industry under the auspices of how it impacts food safety and things like traceability.

The other——

The CHAIRMAN. Well, we'd like your recommendations, and my time has expiring here, I apologize, but your view on ransomware?

Dr. VAN DE LIGT. That is where I was going, on ransomware.

Ransomware is really the nemesis right now, and as publicity increases and more people are paying off ransomware attackers, it becomes more lucrative for them to be able to do that. And that, particularly, is true in the realm of cryptocurrencies.

So, I think we will see a rise in ransomware; however, we are also finding that there is a way to pull back. I think like in the case of JBS, through our FBI and our Federal partners, they were able to pull back some of that payment. So, that offsets it. But publicity and money, it drives a lot of evildoers in the society, and so, I do think we can continue to see it—cyberattacks continue to perpetrate themselves.

The CHAIRMAN. Well, my time has expired, but, this is something I want to pursue further in terms of the appropriate role in which we can protect the private-sector, because I think this is going to continue until, whether it is through the NSA or FBI or other means of the Federal Government to provide this protection, because of the factors that are involved.

My friend, the Ranking Member, it is your opportunity to ask questions or make comments.

Mr. JOHNSON. Thank you, sir.

Dr. Aherin, I will start with you. I thought your addendum to your testimony was very interesting insofar as it showed how high packer margin had been in the last 3 or 4 years, and then how modest it was in maybe the 10 or 15 years prior to that.

We have heard some discussion today about an extra 5,000 head of capacity likely coming online. What would be—maybe in just 1 minute—what would be the impact on packer margin if that new capacity does show up?

Dr. AHERIN. So, all else equal, expanding packing capacity would likely reduce packer margins, because it is going to increase competition for cattle, which will drive up cattle prices. And I think it is important to remember that packers are margin operators, so the money that they make is the difference between beef price and cattle price, and the cost that they incur to turn those cattle into beef.

Mr. JOHNSON. And we have seen futures trend up. Is the market baking in some of these assumptions about capacity expansion?

Dr. AHERIN. In terms of futures, I think the primary driver, at least in current contracts, is tightening cattle supplies. We largely worked through the one million head backlog that was created in the second quarter of 2020 when all those plants were shut down or slowed down, and we are going through extreme drought situations in much of the country. The cow herd is in a contractionary phase. So, a lot of these plants that are being built, if they are successful, won't come online for a number of years. So, I think the most immediate price moves are due largely to cattle supplies.

Mr. JOHNSON. Yes, excellent point about the short-term *versus* the long-term.

So, I mean, I would be interested in getting the take on this next question from Dr. Aherin, Dr. Lusk, Dr. Jacobs if we have time.

Dr. Lusk, I was struck by your point. I will put some words in your mouth, but basically that just expanding capacity maybe in a dumb way might create another set of bankruptcies or acquisitions on the capacity side. I think we do—to the extent that we do anything, I think we do want it done in a smart way and in a way that will create some abiding and some sustainable benefits.

So, Drs. Aherin, Lusk, Jacobs, how do we try to make sure that these policy interventions are done in a helpful, long-term beneficial way?

Dr. LUSK. I think from my perspective, the best case for expanding capacity is really the one related to the resiliency issue. In my view, resiliency is not necessarily related to the size or the location.

The problem we had during the pandemic was just there wasn't enough space for those cattle to go, and the problem was there was no individual packer's capacity to have excess capacity that they are not currently utilizing. I don't think there are really any easy answers to that problem, but you know, if you want excess capacity to exist in the system, somebody has got to pay for it at the end of the day.

Dr. AHERIN. From my perspective——

Mr. JOHNSON. Not to put words in your mouth, but I think the whole point of your testimony is that cooperative ownership could provide a way to invest in a way that you would think would be more sustainable and abiding. Is that right?

Dr. JACOBS. Yes, that is right, and I think there are a lot of benefits to a supply chain from cooperation and producers have the ultimate incentives to ensure the sustainability, the security of their supply chains. Their livelihoods depend on it.

I do want to say, though, however that the margins have to be there. A cooperative model is not a fix to a market to a business model that is not profitable, part of the supply chain is not profitable. So, that has to be there and that is why I was suggesting that there needs to be investment to help understand what the minimum efficient scale is so that there can be margins that—producer ownership and processing, and help in scaling up to that.

Mr. JOHNSON. Thank you.

Dr. Aherin, the last minute is yours.

Dr. AHERIN. So, one thing I think we really need to focus on is, it is not just about facilities. We have to be able to meet consumer demands in a cost-effective manner, and simply trying to replicate commodity cattle processing facilities, beef processing facilities for some of these smaller initiatives really is probably not destined for success. So, I think really investing in research and market research and business model development, understanding consumers and how do we get the cattle that we need to meet that product differentiation. I think that is where a lot of the focus needs to be.

Mr. JOHNSON. Thank you, and Mr. Chairman, I yield back.

The CHAIRMAN. I thank the gentleman, and the next Member to be recognized is Congressmember Craig from Minnesota. Congressmember, are you on there? I see you.

Ms. CRAIG. Yes, Mr. Chairman. Thank you so much, Chairman Costa, and thank you to Ranking Member Johnson as well for calling this hearing to focus on the beef supply chain and the overall security of our food supply chain.

Given the consolidation in the beef packing and meat processing industry and the events of this past year, including the COVID–19 pandemic and the increasingly common cyberattacks targeting U.S. industries, today's conversation is especially relevant.

Thank you also to those who have testified today. I appreciate the input you shared with us, and I am especially grateful for your work to tackle these incredible challenges we have before us.

During the most recent meeting of my bipartisan Farmer Advisory Council, the issue of processing capacity and supply chain stability came up over and over. Producers in my district have struggled to get their product to market due to the facility closures during the pandemic, and other unexpected events like the JBS attack. Unfortunately, we don't know when the next cyberattack or black swan event is coming, and farmers and ranchers in my district need these supply chain issues addressed immediately.

With that perspective in mind, I want to ask a question both to Dr. Aherin and a question to Dr. van de Ligt.

First, Dr. Aherin, thank you for your testimony and your mention of how additional processing capacity can come from new facilities and also from expansion and increased investment in existing facilities. Can you talk a little more about the challenges that existing facilities face when seeking to expand their operations, and what steps could be helpful in addressing those challenges?

Dr. AHERIN. Certainly. One of the biggest challenges facing existing operations is labor and meeting the labor needs. A facility doesn't do any good if we don't have the labor or the technology to put product through that facility. I think one area that really deserves a lot of attention is technology and automation, and trying

to work smarter, not harder in terms of getting beef product through these facilities and relieving some of these labor challenges.

So, a key point I want to make is that when I talk about processing capacity, I am really focusing on operational capacity. So, not the physical size of the facility, but what is our throughput? And you can increase throughput in a number of ways, and one of those ways is more efficient production through technology.

Ms. CRAIG. Incredibly important, thank you.

I now want to turn to Dr. van de Ligt. Thank you for your leadership on food systems security at the University of Minnesota. Your testimony on the current state of cyber resilience in the food supply chain makes it incredibly clear that we have a long way to go in ensuring immunity from sophisticated attacks on operating technology systems. Your recommendations are incredibly helpful.

I am wondering if you can expand a little bit on what companies are doing in light of the JBS cyberattack to improve their cybersecurity systems. What can Congress do to ensure those efforts are thorough and successful?

Dr. VAN DE LIGT. Thank you, Congresswoman Craig.

So, the private-sector obviously takes these risks very, very seriously. Anytime that they are down with a cyberattack, they are losing money. So, there is an economic incentive to prepare. What is difficult is that many of our private-sector partners don't really embrace or fully understand the difference between informational technology, so email, data records payroll, things like that *versus* their operational technology. So, one of the things that can be done is working with this collaborative partnership of government agencies to really take some of the cybersecurity best practices that are prevalent in other critical infrastructures and adapting them so that they are fluent across both the informational and the operational technologies within—that are specific in the food and ag infrastructure.

And then the other thing is Congress could encourage regulatory agencies to take full advantage of the Food Safety Modernization Act to use the strength of that law to create an equal playing field and a requirement that cybersecurity be an essential component in their food safety plans. Because these cyberattacks, they don't just have the opportunity to cause a company to cease business, they also have the capability of putting unsafe food in the market.

So, the regulatory and the legal structure already exists, it is just encouragement to take advantage of that.

Ms. CRAIG. Thank you so much, Dr. van de Ligt, and I think with that, my time has expired and I will yield back.

The CHAIRMAN. We thank the gentlewoman from Minnesota, and the next Member in order is Mr. DesJarlais from Tennessee.

Mr. DesJarlais, it appears that you are at your office. You have 5 minutes.

Mr. DESJARLAIS. Thank you, Chairman Costa. I appreciate that.

Tennessee is a large producer of cattle. It ranks about 12th in the nation, and cattle and calf receipts rank number two in the state for total farm cash receipts, so this is an important issue for us, as it is in many states. We are blessed to have the largest Farm Bureau in the nation in my district in Columbia, Tennessee, so we

are so glad you are all here today to help us sort through these tough issues.

Dr. Aherin, Tennessee farmers want to know that they are receiving a fair price for their cattle. How can Congress help increase transparency into this cattle market, while also ensuring that today's solutions do not inhibit tomorrow's progress?

Dr. AHERIN. So, from a transparency perspective, I think we need to recognize that mandatory price reporting really does a lot already. I think there are certainly some places where we can investigate expanding some of that price reporting as we reauthorize LMR, moving forward. I think a couple of areas could be reporting some base prices on formula transactions. I also think it is worth noting that in a lot of ways, the formula pricing bucket is kind of a catch-all, and it has become a very large portion of transactions at the fed cattle level. So, there may be some opportunity to just aggregate that a little bit without getting into too many confidentiality challenges.

Mr. DESJARLAIS. Okay, following up to that, what are the positives for farmers and——

Dr. AHERIN. Another area that I think is worth exploring is price reporting——

Mr. DESJARLAIS. Okay, I am sorry. What are the positives for farmers and feedlots to entering various contracts like formula grid future with the packers rather than just selling cattle through negotiated trade?

Dr. AHERIN. So, alternative marketing agreements, which are agreements that occur outside of the calf spot cash market, they really help to minimize supply chain risks, reduce marketing costs, increase capacity utilization both at the feedlot level and the packer level. So, really, what this does is it reduces operational costs and operational risks, which, in turn, filters down to being able to pay higher prices for cattle as it goes back to the cow-calf sector.

Mr. DESJARLAIS. Okay. Thank you, Doctor.

My last question is for Dr. Lusk. Labor recruitment retention is a chief concern shared by meat producers of all sizes. How do labor shortages at meat plants impact cattle producers, and in your view, can Congress do anything to aid in workforce recruitment and retention efforts?

Dr. LUSK. I agree with what Dr. Aherin said earlier, that what you really want to focus on is effective capacity. Even if you have the buildings, you need the labor there, and so, in a way, labor acts as a constraint on capacity.

Visa issues, there is a lot of foreign labor that is employed in these plants, thinking about immigration and visa policies that increase that availability, and then, of course, thinking about opportunities for domestic workers too, whether it is workforce training or what have you, I think are important.

And then the other piece of this is investments and research related automation to make these plants less reliant on laborers. So, I think a combination of those are three things that you could think about, immigration issues, training issues for domestic workers, and then investments in research and automation.

Mr. DESJARLAIS. Okay. I said that was my last question, but in the here and now, have you noticed a difference from state to state

on labor shortages where states like Tennessee that drop the unemployment bonus, the $300 per week unemployment bonus, have you seen an increase in uptake in production in those state that have done that?

Dr. LUSK. Sure. I mean, this is a matter of debate among some economists a lot of impact that extra unemployment benefits and payments have been associated with the COVID recovery Acts have done to our labor force.

My view is it probably has some effect. It has had some effect on people's willingness to engage in the labor force. What we do see is in food processing, we have seen some pretty significant increases in wages as well, so it is an attempt by packers to try to pull up, pull labor in, but that is fighting against people's other incentives to do different things. So, I think it is a difficult balance there.

I am not personally aware of big regional or geographic differences in there, although I am sure they probably exist.

Mr. DESJARLAIS. All right. Thank you, Dr. Lusk, and Chairman Costa, I yield back.

The CHAIRMAN. I thank the gentleman for yielding back, and the chair will now recognize the gentlewoman from Iowa, a very significant beef state in this country, Congresswoman Axne. Congresswoman Axne, are you there?

Mrs. AXNE. I am here, Mr. Chairman. Thank you. Can you hear me?

The CHAIRMAN. Please, go ahead.

Mrs. AXNE. Okay. Thank you, Mr. Chairman, for holding this important hearing certainly, and the witnesses here for sharing your testimony with us on the Committee.

We all know that over the last year and a half, the COVID–19 pandemic exacerbated our supply chain issues with the beef industry, and our producers faced bottlenecks, and processing price fluctuations, and increased uncertainty. These issues aren't new, and as a result, producers in Iowa are definitely feeling the harmful effects.

I have heard time and time again from my constituents something needs to change, so just this month, I was with Secretary Vilsack touring a couple of operations in southwest Iowa for the Secretary's announcement to expand processing capacity. And we heard directly from producers who told us they recently literally had to sell their cattle at a loss only for the packer to turn around and make a higher profit on it.

I know these stories aren't unique. We have all heard of them, and I am sure many of my colleagues on both sides of the aisle would attest that we need to change that. Obviously, this isn't right. It is not sustainable, and it is something that we need to change. I am so glad that Secretary Vilsack is putting funds from the American Rescue Plan towards this issue to help us expand more processing capacity and increase competition in the industry.

We need more regional processing, more price discovery, and more competition so our family farmers in Iowa can be profitable and stay in operation.

So, Dr. Jacobs, first off, always great to see an Iowan. Thank you for being here before the Committee and joining us today.

I am particularly interested in the ideas in your testimony to support producer ownership of processing facilities. You gave a couple of examples of smaller scale operations that are producer-owned but noted that there really aren't any large-scale facilities that are owned by the producers.

So, my first question is you offered a few reasons as to why this might be the case, such as economies-of-scale and suggested that USDA reaches minimum efficient scale for processing. Can you elaborate a bit here as to what such a study might look like, and what you think they might find?

Dr. JACOBS. Thank you for that question, and I can elaborate on what a study might look like, and I think it is important to understand that, I want to clarify as part of my testimony that I wasn't trying to suggest that producer ownership may reach the same capacity as some of the very large processors we have right now, or maybe that it is even necessary. But they do need to reach a capacity—that allows for some profitability in those margins.

And I think what is important to note here is that when you have producer ownership in the downstream markets, for example, producer ownership of the packers—the processing, excuse me. The example you gave where the livestock producer lost money on the sale of cattle to the processor only for the processor to have a very large margin, all of those then, that value would be aggregated back at the producer. So, that does help solve that—partially mitigate that challenge.

I think a study needs to understand—and I know we see a number of plants that have announced coming onboard potentially at 500 head per day. Anecdotally, I think that is the number I have heard, and I am not prepared to testify about the economics of that because I am not an expert in livestock economics. But I think something to understand where, on average, margins can be profitable at the processing level. They don't necessarily have to be on the same level of margins of the very large-scale processors. But something to understand that is needed. And I think we have the data to do that, and we, through surveys of existing processing and producers and the data we have, I think we can do that.

Mrs. AXNE. Just out of curiosity, how long do you think a study like this would take?

Dr. JACOBS. How many economists are on it? Sorry, that was flippant.

A couple months? I am not really sure.

Mrs. AXNE. Okay. I just want, for curiosity because as we get moving on this, I want to see what kind of timelines we are looking at. I appreciate that.

The other thing I wanted to see if you could expand on in your testimony is how these producer-owned facilities would be more resilient and could navigate some of these supply chain problems that we have talked about today?

Dr. JACOBS. I think the resiliency really comes through the coordination that happens between the producers and the part of the supply chain they own. So, when you have communication between the producers and the company that they own, you get more information exchange. You get more pricing exchange. It allows producers to be closer to the consumer and closer to the wholesale and

the retail markets, in that case. And so, while we don't have examples, we can't say for sure, for example, that the experience of a producer-owned or a cooperative and processing would have been any different in the face of COVID or some of the other shocks that we have had, we do see examples where cooperatives have exemplified more resiliency.

One example of that, for example, is Land O'Lakes during COVID didn't dump a single gallon of milk. Now, their situation is different and the shocks to their supply chain were different than what would be facing livestock processing, but I think because the communication, because of that, that intricate tie between the producers and the processing that could exist, you are going to get more creative solutions, in my opinion.

Mrs. AXNE. Well, I appreciate that, and as somebody who spent time talking with the CEO of Land O'Lakes and knows a little bit about how they operate, I couldn't agree with you more. I think their internal operations helped them create the resiliency that they needed.

So, thank you so much. I appreciate that, and I yield back.

The CHAIRMAN. We thank the gentlewoman. Her time has expired, and the chair will now recognize the gentleman from Mississippi, Mr. Kelly.

Mr. KELLY. Thank you, Chairman Costa, and thank each of you witnesses for being here and this important testimony.

Dr. Lusk, you mentioned immigration. Specifically, what policies or work policies can we implement in that arena to make it better?

Dr. LUSK. I can't claim to be an expert on those issues; but, from my understanding, numbers of H–2A visas, these sorts of things, the types of workers that would be most likely to work in these processing plants would be a place that I would start looking. But, there are probably people more qualified than me to answer that specific question.

Mr. KELLY. Okay, but to make it easier for renewals and to make sure that we can get those folks in here when we need them and to make it easier for them to get here and work, that definitely helps, whether that is electronically or just easing up on the process for green cards?

Dr. LUSK. Indeed.

Mr. KELLY. Okay. Second for you, what effects did you see in the market as a result of the JBS attacks and have they been resolved, and if so, how quickly did that occur?

Dr. LUSK. The impacts of the JBS attack were sort of—they were a bit confounded with the holiday event, on the holiday weekend. Many packers will actually process fewer cattle on holidays to begin with, and this happened to occur at the same time that probably they would have reduced processing fewer cattle in the first place.

So, it appears that the market impacts of that were fairly short-lived, and Professor van de Ligt can talk about this more than me. My understanding is that JBS had some backup systems so they were able to get back up and running, and there are things I think individual producers can do to make sure that when these things happen, that their effects are, indeed, short-lived, and that seems to be what happened in this particular case, fortunately.

Mr. KELLY. Okay.

Dr. Aherin, I have a question. As you know, U.S. cattle herd cycles through periods of expansion and contraction over the course of several years. During peaks and herd expansion, cattle prices tend to be lower because of the higher availability of supply. Conversely, during the troughs of contraction, cattle prices increase as more packers compete for tighter cattle supplies.

I am proud that we have our great big meat packers, but I also believe in the diversity in having more smaller sources. So, with that in mind, what tools do small beef packers and processors need to remain solvent and successful during the contractions, when they are competing with larger firms for finishing cattle?

Dr. AHERIN. I think, number one, they need to be able to identify consumer demand opportunities that they can differentiate their product from, just commodity product. I also think they need to be able to coordinate their supply chains, both with cattle producers and within product beef consumers. So, being able to make sure they can supply the cattle that they need for their operations is critical.

Mr. KELLY. And then finally, Dr. van de Ligt, for you, these cyberattacks are going to continue until we either make the cost high enough for the people that are conducting them, or either we harden ourselves such that it becomes so difficult that it is no longer profitable.

With that in mind, what can USDA or we in Congress do that would make it easier for us to defend a cyberattack, especially some of our smaller places, smaller farms or smaller producers that just don't have the basic tools and knowledge in order to prevent a cyberattack or make it difficult?

Dr. VAN DE LIGT. Thanks.

So, as an academic, I am going to say education, right? So, most of the cyberattacks, there is a human element to it. There is a lot that we can do to harden systems, but it is that human machine interface that often presents the openings for these cyberattacks to occur.

So, education not only for all of our owners and operators, but also education in—for specific cybersecurity professionals that really understand the operational environment into these facilities I think what will truly be critical. And to me, USDA can—USDA and DHS can play a role in that by making really clear—adapting those cybersecurity plans that other critical infrastructures use to make it really super easy and understood to our food and agriculture partners.

But it is really—it is an education process.

Mr. KELLY. Well, I want to thank all four of you witnesses. I have no doubt with great minds like yours advising this Committee and our nation, that we will work through all the problems that we have. Thank you very much for your time today, and I yield back, Mr. Chairman.

The CHAIRMAN. All right. The gentleman yields back his time. We thank him for his questions.

The chair will now recognize the gentleman from Illinois, Congressman Rush, as our next Member, and then followed by Congressmember Bacon.

Congressman Rush?

Mr. RUSH. Thank you, Mr. Chairman, for this very exciting hearing.

My question is directed to Dr. van de Ligt.

Dr. van de Ligt, I want to thank you for your excellent testimony today regarding cyberattacks. This is an issue that I am extremely concerned about. I am the Chairman of the Energy and Commerce Committee's Subcommittee on Energy and Power, and I have championed solutions to cyberattacks in the energy sector.

I believe that this multi-sector problem will also benefit from a broader solution and end the threat to our food supply chain issues. It's really, really troubling to me. In particular, I am concerned about ransom payments, which you succinctly stated that attacks will continue [inaudible] cryptocurrency, which, of course, is hard if not impossible for law enforcement to track.

In your excellent testimony, Madam van de Ligt, should the government prevent companies from paying a ransom? Why or why not? And, second, same [inaudible] currencies using cryptocurrency? Why and why not also?

Dr. VAN DE LIGT. Thank you for the questions.

It is tough to say that there is a one policy fits all here. If you think about the attack on JBS, they had encrypted backups and they were able to rebuild their systems, and could potentially have done so even without the ransomware payment. But they were concerned about data that could have been stolen that they wanted to be able to recover.

But in the most recent Kaseya attack, there are still many in the industry, not just food and ag sector, but also affecting some academic institutions, where their data is now completely locked because they don't have an encryption key to recover that. And so, you are going to lose multiple years of research effort and initiative.

So, I think if we go down the path of a policy to say we can't pay ransomware, that is going to be a difficult one to navigate.

And then cryptocurrency is also interesting. My personal view is I think cryptocurrency is here to stay; but, having our Federal authorities, our digital authorities that are working actively, NSA, FBI, those guys, a better understanding of how and monitoring that space and monitoring that electronic space is going to be really critical, and they proved their essentiality by being able to pull back some of the JBS cryptocurrency money.

So, I think it is going to be a really tough area to navigate, and we should certainly do it in a collaborative public-private fashion.

Mr. RUSH. Thank you.

Switching gears, Dr. Lusk, how do we—I am sorry. Dr. Jacobs, I am sorry. Dr. Jacobs, I want to thank you for your fascinating testimony on the importance of cooperatives. What is the average size of a producer-owned agricultural cooperative, and while I understand that cooperative membership cannot discriminate on the factors of race and other factors, do you know whether African American producers are proportionately represented in the cooperative sector? Are there any barriers that would prevent them from choosing to join a cooperative, and if so, what do we need to do in order to lower those barriers?

Dr. JACOBS. Thank you for that question. You asked some insightful ones, and I will say my familiarity in working with agricultural cooperatives is primarily dominated by my experience in the Midwest. I do know that cooperatives exist, and in fact, some of the early historical cooperatives did have—were owned by African Americans in the Southeast, and so, while we don't see—in my work, I don't see representation, that representation does reflect what we see of the demographics of farmers.

It is important to note that cooperatives are voluntary organizations, so voluntary and open membership, and you are right. They do not, should not discriminate on the basis of race or age or on religious preferences or along those lines. So, there are opportunities, and what I would encourage states to do is look at their cooperative statutes and make sure that they are appropriately structured, such that there are no barriers to participation by any race.

Mr. RUSH. Thank you.

Mr. Chairman, I think that concludes my time. I want to yield back.

The CHAIRMAN. I thank the gentleman from Illinois. He yields back, and the next Member in order is Congressmember Bacon.

Mr. BACON. Thank you, sir.

The CHAIRMAN. Thank you.

Mr. BACON. Thank you, Mr. Chairman, and thank you to all our experts testifying today.

This is a very important subject for Nebraska. We are the number one beef export state in the country, and it is vitally important to our economy.

My first question is to Dr. Aherin and Dr. Lusk. The USDA recently announced the availability of $500 million in assistance to help increase and diversify U.S. processing capacity. Do you anticipate they will need to be highly specialized to succeed, and if so, how important might alternative marketing arrangements, specialized formula purchase agreements be to this success? Thank you.

Dr. AHERIN. I will share my thoughts.

Mr. BACON. Go ahead.

Dr. AHERIN. So yes, I do believe these new ventures, if they are going to succeed, will need to be specialized and in terms of AMAs, alternative marketing agreements, I think they are the best way to ensure that these new plants can get the specialized type of cattle in a consistent manner in order to meet the demands of the brand that they are trying to build.

Mr. BACON. Thank you. Any other input?

Dr. AHERIN. One point I would make—and we talked a lot about producer ownership and cooperatives, and I just want to provide an example that has proven very successful in the beef industry, and currently it is not in the form of a cooperative. I will use names. It is all public information. But U.S. Premium Beef is a company that is producer-owned, and it is a minority but significant shareholder in National Beef, the fourth largest packer in the U.S., and previously to that, they were majority shareholders in that packing company. So, just an example of how producer ownership has been successful in some cases.

Mr. BACON. I think that is a great example of an alternative marketing arrangement.

Are there other examples like that? Thank you.

Dr. AHERIN. On that scale, certainly not that I am aware of, but no. Producer ownership in some plants has been definitely attempted in the past, and a lot of the roadblocks that those types of ventures run into is not clearly identifying how they are going to sell every pound of beef that they have. Not just the consumable product, but rendering, the hides, offal. So, there is really a lot that needs to be done on the back-end of the plant, as much as with cattle coming in to ensure that any business is going to be successful.

Mr. BACON. My next question is for anybody on the entire panel. When I was first elected in 2017, the 115th Congress, I made the foot-and-mouth vaccine disease bank a top priority to get funded. I think this year we are in the final year of getting an IOC and operational. Could you just talk about maybe the importance of protecting our cattle market, our processors, and this whole industry from foot-and-mouth disease, and the importance of having this vaccine bank? Thank you. I will just open it up to anyone who would like to speak up.

Dr. LUSK. I think we can look at the impacts of some of those animal disease events, whether it is foot-and-mouth disease or even before that, the mad cow incidents that have extraordinarily negative impacts on the industry.

One of the ways that happens is through losing export markets. That is another answer to how some of these new plants could differentiate themselves is by specializing in products that are demanded by certain foreign customers.

When you think about risk mitigation, investments in vaccines and understanding the impacts of new emerging diseases I think is critically important in ensuring the health of the industry.

Mr. BACON. Well, Mr. Chairman and to the Ranking Member, I guess this is a success. I think the Committee in getting this foot-and-mouth disease vaccine bank stood up. I think we are hitting the final year of it becoming an IOC, and it is something we can feel proud of that we led in this Committee.

Thank you. I yield back.

The CHAIRMAN. Thank you, and vaccines work, as we all know. We were just commenting on—any of us who grew up in agriculture and cattle dairy industry understands the concepts of vaccines and herd immunity and everything else, so that is just, as my father used to say, common sense. But then he would pause and say I am not sure why they call it common sense. It doesn't seem to be that common.

Our next questioner, I think we have—oh, Members, votes have been called and so, it is the chair and the Ranking Member's intention to continue this hearing. So, I believe there are three votes and we will just alternate them, and for everybody's understanding, the list that I have here in front of me is on the Republican side: Baird, Mann, Feenstra, Moore, and Rouzer. On the Democratic side: Hayes and Spanberger. Hayes has her camera off, I am told, and Spanberger is voting, so I will defer to Mr. Baird.

Mr. Baird, you are next. You are up to bat.

Mr. BAIRD. Thank you, sir. We appreciate it, Mr. Chairman, and appreciate the opportunity with the Ranking Member Johnson and being able to participate in this very important issue of cattle mar-

keting. I really appreciate the expertise that we have in the witnesses before us today.

Dr. Lusk, I am going to probably start with you. We appreciate all the work that you and your team do back at Purdue. That is my alma mater, and you provide tremendous information to farmers and ranchers, as well as many, many entities within the food supply chain. And you give them the information to make better and more informed decisions.

But I am going to start, in your testimony, you describe how a small number of cattle that are sold on the cash basis influence the price of a much larger number of formula price cattle, and how this may not allow the formula price market to truly reflect these market fundamentals. So, I think I am a little reluctant since the data and some of the decisions we are talking about are based on 2 very volatile years, the fire at Holcomb, Kansas, as well as the pandemic year. So, I would appreciate—and we know that the cattle cycle in order from the time you decide to breed a cow until that finished steer makes it to market can be 2 or 3 years.

So, how do we—how do you think we can do price discovery, improve the prices for the producers, and yet not lose some of the economies-of-scale that we have in the current slaughter capacity? So, that is my question. I would appreciate your thoughts.

Dr. LUSK. Yes. So, first thanks for your excellent representation in Indiana, Representative Baird, and we are proud to have you as an alumni at Purdue University.

I think there are a variety of ways to think about improving price discovery. I think there is some debate about how many transactions one actually needs for good price discovery, and it is not necessarily clear we are at a point where there are too few, but there are certainly some people who would argue that we need more.

A couple of ideas have been floated to improve more, to increase the amount of information that is in the market. There are some proposals for a market maker program, essentially a mix of assessments and sort of subsidies, incentives for people to trade in a cash market. There emerged some electronic trading markets, for example, the fed cattle exchange is one that has the ability to bring more transactions in a very transparent way to the market. There have been some proposals floated for a mandate. I think I have made my view clear that I think that is probably fairly costly, but there could be ways to make such mandates less costly through things like a cap-and-trade type of program.

Mr. BAIRD. So, I also noticed that you encouraged maybe one of the things we could do would be to improve consumer demand, as well as producer productivity, and look for those efficiencies. Do you care to elaborate on that any more?

Dr. LUSK. Sure. One of the great things about working at a land-grant university is I get to see all the fantastic work my colleagues are doing at the university. So, when I look at my colleagues in the Animal Science Department or the Vet Med Department, they are working all kinds of interesting things like putting wearables on dairy cattle to monitor their movements and using artificial intelligence to get early warning detection of disease. Some of my colleagues are working on biosensors to detect bovine respiratory dis-

ease early and an affordable way to do that. Studying heat stress, how you can reduce that heat stress in animals and animal health issues so that we can reduce reliance on antibiotic issues. And we have a big research program here at Purdue focused on improving animal welfare issues.

So, I think there are a lot of really interesting things going on, and some of that is aimed at improving sustainability of the beef supply chain, but hopefully providing a higher quality product to consumers as well.

Mr. BAIRD. Thank you. I appreciate that very much. Anyone else care to comment on that, the production efficiency and so on, and maintaining the capacity?

Dr. AHERIN. Congressman, I will add a couple thoughts, and this is more along the lines of price discovery.

I think we have seen in other species that we don't always have to discover price solely at the livestock level. There are examples, particularly in swine, where they use meat prices to help determine the price of hogs that are on formula. So, I think any mandate that would dictate that we have to price a certain number of cattle off of a cattle cash transaction certainly hinders the ability to adapt to maybe some new opportunities to price cattle off of beef itself sometime down the road.

Mr. BAIRD. Thank you very much.

Dr. VAN DE LIGT. This is——I was going to say, this is Dr. van de Ligt. I just want to play on Dr. Lusk's comment.

All those technologies that he mentioned in his response to the question about improving efficiency, the biosensors and such, those are all operational technology issues that now takes that cyber concern that I have at the packer level all the way down now to the producer level.

Mr. BAIRD. Thank you very much, witnesses, and I see my time is up, so with that, I yield back, Madam Chair.

Ms. SPANBERGER [presiding.] Thank you very much, and to our witnesses, I am filling in for Chairman Costa while he goes to vote.

I will now recognize myself for 5 minutes.

I am excited to be here today to talk about an issue that matters deeply, not just to the many cattle producers across my district, Virginia's 7th District, but to all of us across the country that have come to rely on affordable, high-quality and readily accessible U.S. beef. Across my district, I have heard about how disruptions to our supply chain brought on by the COVID–19 pandemic have threatened the livelihood of livestock producers over the last year. And unfortunately, volatility and uncertainty in the beef and cattle markets are not new. Continued consolidation within the meat packing and processing industry have resulted in long-term reductions in processing capacity and increased risk from an unexpected and unplanned disruptions.

This is why I was proud to work with my colleague, Representative Dusty Johnson, to introduce the Butcher Block Act (H.R. 4140), which would establish a loan program at USDA for new and expanding meat processors, as well as a grant program to help increase hiring and processing capacity at these plants. I have been excited to see USDA take steps with funding provided through the American Rescue Plan to help increase competition for meat and

poultry processing, and I believe the Butcher Block Act would help expand these efforts and ensure their longevity.

So, Dr. Lusk, I would like to begin with a question for you. Can you explain or speak to how having increased diversity in the supply chain, such as more small- or medium-sized plants, could help reduce the likelihood that a black swan event will have such a large impact on cattle and beef prices?

Dr. LUSK. Well, the hope is that if some future pandemic comes along and it affects the workforce of a plant, that if one goes down there is enough heterogeneity, diversity in the system that the aggregate supply side effects are fairly minimal.

I think the challenge, the tradeoff that exists there is this issue of economies-of-scale that has been mentioned that to really produce beef at an affordable price, you really need to be large—achieve some high level of volume is one of the reasons we see the kinds of large-scale packing that we have in the sector. And as a result, if you look at the number of cattle, say, processed by a fairly small plant, it is a fairly small share of the overall story.

I think there is value in having some of that heterogeny and diversity in the system. I think the question is really at what cost? We will have to assist them. Can they stay in business and compete?

I think one issue that I see is related to the cyberattack issue. In some ways, I think the larger plants are more vulnerable to cyberattacks because they are a bigger, more lucrative target to seek out. So, in some sense having some smaller and more diversified plants could help in the sense they may be less visible to people seeking to disrupt our food supply chain through that mechanism.

Ms. SPANBERGER. Thank you very much, and thank you for that comment related to potential vulnerabilities to cyberattack.

In your opinion, are the recent investments by USDA and by small- and medium-sized processors enough to mitigate the current issues that we are seeing in cattle and beef markets, and do you believe that Congress should take any additional steps, or do you have any suggestions that you would want us to be highlighting related to supply chain resiliency?

Dr. LUSK. I mean, I think we are already in a process where we are realigning processing capacity with cattle numbers. So, my fear, to be honest, is that we wake up 3 years from now and have a bunch of processors that can't affordably operate. Adding more capacity will, in the short run I think help support cattle prices, but I think what we have to hedge against is, not now, but 4 or 5 years from now when we get those numbers realigned is to make sure you keep an eye out for what is happening, and are we going to see a series of bankruptcies or reductions in plant sizes. I think that is my concern with the additions of capacity we are seeing at the moment.

Ms. SPANBERGER. Thank you very much for that.

And, Dr. Aherin, would you care to comment on that question or add anything to the answer?

Dr. AHERIN. Certainly. In a lot of ways, I would echo what Dr. Lusk mentioned. I have put in my testimony that I think there is opportunity for about 5,000 head of operational capacity, and

again, I am going to highlight that, meaning it not only could come from physical facilities, but could come from improved efficiencies and throughput and better being able to staff these facilities.

I also want to highlight that that 5,000 number that I have put out is very contingent on the depth of the contraction in the cow herd, and the deeper this contraction goes, the smaller that number of profitable expansion is going to get. And so, again, I will reiterate something I have said all along. I think it is more important to invest in research and education and understanding the business environment than it is in specifically in facilities themselves.

Ms. SPANBERGER. Okay. Thank you very much for that feedback and for your answer.

My time has expired and I will now recognize the gentlewoman from Connecticut for 5 minutes.

Mrs. HAYES. Thank you so much, Madam Chair.

Connecticut is home to ten meat processing facilities. All are small- to medium-sized, mostly family-run facilities. Additionally, we are home to 48 beef cattle producers, according to the State Department of Agriculture.

When talking about beef supply chains and processing, facilities like these are often left out of the conversation. While Congress has appropriated millions to the Coronavirus Food Assistance Program to help producers, including beef cattle producers, only 8.1 percent of Connecticut farmers were eligible. This is a negligible amount, even when compared to other small northeastern states.

These farms and processing facilities also were affected by adverse conditions of the past year. Our producers also had to adapt to the sudden lack of demand from commercial, institutional, and restaurant purchasing. They also had to address the labor concerns caused by COVID, and they also had to adapt to the dropping demand in U.S. export meat. So, my questions will focus on those small- to medium-sized plants that I just mentioned.

Dr. Jacobs, during the pandemic we saw an increase in consumer demand for beef directly from the producer or small, local butchers. Are there signs that this opportunity will remain as Americans return to more normal economic activities, and what technical assistance, workforce development, and other capacity-building is required of small- to medium-sized producers to ensure they can meet food safety standards, consumer preferences, and stay competitive?

Dr. JACOBS. Thank you for that question.

First of all, I think support for that system needs to recognize that that type of small- and medium-scale processing allows the producer to be closer to consumers, and although I don't have the data and can't comment on that, your question about whether or not we have seen consumers return to their pre-pandemic purchasing, the food away from home *versus* food at home and where they are getting their beef, my suspicion is that we are going to have many consumers will remain purchasing their animal products directly from farmers or small processors. I think part of that will stick. How much of it, I can't comment on that and I would be happy to look into that further to see what has remained.

But you mentioned what other ways can we support this, and I want to comment too about and introduce this idea of the USDA's

efforts to provide funding and capacity. I think what is important here is to do the things that you mentioned, which is instead of necessarily offsetting capacity costs, work on the things that are also costs to the input and beef processing, such as labor development challenges. Also, challenges related to meeting regulations and the differential impacts that may have on small producers and small processors, relative to the very large ones. Loan guarantees could be a very important part of this overall package.

What I would encourage is to look at the more indirect investments that can benefit our producers, our livestock producers and their processors. I am glad to hear that there are small, local processors that are doing well, and I hope that they continue to and I might encourage those that are family-owned to consider thinking about a model in which they coordinate, in which they consolidate, and maybe there is an opportunity there for joint processing capacity, shared capacity that allows them to scale up.

Mrs. HAYES. Thank you.

You mentioned it briefly, but can you just touch upon what are the benefits of having more local and regional processing options where they are right next to their consumers?

Dr. JACOBS. The benefits are options for consumers. The benefits are flexibility. When you have challenges in larger scale processing, even though our—as I understand it, our small- and medium-scale, we don't have enough of those to pick up slack when we have major disruptions at some of our largest processors. That local scale is important to the continuity of our food supply chain locally. It is important to the local rural economies where those farmers are living and the processors are, and they are paying wages and they are paying taxes. And so, I think the benefits go well beyond what we see as profitability, *profitability margins* at those levels. And that is one of the features I love about the cooperative model is that many of those benefits stay local, and those benefits aren't just confined to profitability-based benefits.

Mrs. HAYES. Well, my time is almost up so I won't have time for another question, but I agree wholeheartedly with everything you just said, and I know, at least in Connecticut District 5, if you go to any restaurant, you go out to dinner, you know that that beef is from Connecticut when it is, because it is fresh and people immediately identify the name of the producer that it can be attributed to.

Thank you so much. Madam Chair, I yield back.

Ms. SPANBERGER. Thank you.

The chair now recognizes the gentleman from Iowa for 5 minutes.

Mr. FEENSTRA. Thank you, Chairman Costa and Ranking Member Johnson.

The consolidation of the cattle industry is one of the most critical issues in my district. I hear about this all the time, probably the most important issue in my district at this point. Cattle producers in my district are angry, and they are worried that they are getting a raw deal. They see everyone in the supply chain making large profits while they are losing from $100 to $150 a head. My in-laws, my friends, my constituents are seeing their livelihood end because of this.

The processing of cattle is mostly operated by four packers, and they control approximately 80 percent of the market. This market share lets them control the price through contracts, manage the amount being slaughtered through line speeds, and decide when livestock is needed for their own profitable benefits. The system is set up where the packers will very rarely ever see a loss, creating massive guaranteed profit, while rural farmers are on the hook to lose lots [inaudible].

Congress needs to engage in this and focus on transparency and competition and processing capacities. The cash market for live cattle has been declining over the last decade. At the same time, we see higher grocery prices and even higher demand. Diminished cash market participation contributes to USDA being unable to publish LMR reports, furthering the market's lack of transparency.

So, this is my question. My question is for Dr. Lusk. In 2005, 52 percent of the cattle were purchased on the cash market. In 2020, that has gone down to 23 percent. The reverse was true as well. In 2005, 33 percent of the cattle were purchased through formula contracts, yet in 2020, 62 percent are on formula contracts. Knowing that the cash market price is primarily used on the basis for formula pricing, how has the decrease in cash-negotiated trade impacted the market and price discovery?

Dr. LUSK. Yes, I think it is important to, again, distinguish between when you are talking about price discovery, about price levels and then sort of market fundamentals, and I think the concern with the smaller share of cattle being sold in the cash market is whether you are getting sufficient price discovery. But even if 100 percent of cattle were being sold in a cash market, it doesn't mean prices would have been any higher than what we recently observed.

In regards to LMR, the things that could be done to increase the amount of information that is being conveyed through there, thinking about confidentiality rules, about some of the additional details that could be provided about formula contracts, those sorts of things to provide even more price transparency. I think even doing that, there is not necessarily any guarantee that is going to improve the price level, which is a separate issue.

Mr. FEENSTRA. Well, I am glad you said that. Smaller farms, you probably don't realize this, but there are 700,000 farms in the country. Ninety percent of them are family-owned. My in-laws are one of them, own 1,000 to 2,000 head of cattle. My friends own 2,000, 3,000 head of cattle and they are considered small farms.

The problem is when you have large operations, you have 30,000 or 40,000 head, it shuts out people like my in-laws and my friends and my family because they are going through a cash basis and not formula contracting. That is why people get a little grumpy.

So, my other question is in regard to the many proposals before Congress aiming to increase price transparency in the cattle market. Cattle producers, just like any other business owner, would like to receive higher prices for their product. What is your assessment on requiring certain levels of negotiated transaction to improve producers' bottom line, Dr. Lusk?

Dr. LUSK. Sure. To be honest, I don't necessarily anticipate that policy as improving overall price levels. I think there could be some benefits in some of those policies improving price discovery, but I

don't necessarily think we can expect those policies to improve the price that cattle producers are getting paid today.

Mr. FEENSTRA. Well, thanks for your comments, and this is a great concern, because we are going to lose thousands and thousands of family farms that are doing this that are getting bullied out, pushed out by packers and formulated contracts.

With that, I yield back. Thank you.

Ms. SPANBERGER. Thank you.

The chair now recognizes Mr. Mann of Kansas for 5 minutes.

Mr. MANN. Thank you, Madam Chair. Thank you, Chairman Costa and the Ranking Member Johnson for having this important hearing today.

This is crucial to the ag industry as we know it. I am glad that we are doing this Subcommittee hearing. Frankly, I would like to see this be a full Committee hearing, because I am hard-pressed to think of any issue facing agriculture in America today that is more important than what we are seeing in the cattle markets, and the importance of the beef industry specifically to American agriculture.

It is also very important to my district. I represent the big 1st, the largest beef producing district in the country. Our family has farmed fed cattle for 120 years. I grew up in a small feedyard preconditioning and doctoring sick calves, so this is near and dear to my heart personally as well. I am also a proud K-Stater, and I am really glad to see a lot of K-Staters here as well.

I have a lot of concerns about what we have seen over the last 20 months. My first question would really be to both Dr. Jacobs and Dr. Lusk. Congress and the USDA have allocated hundreds of millions in funding toward additional slaughter capacity to help small and medium meat and poultry processors over the last couple of years, obviously an announcement more recently as well.

There is currently a shortage of shackle space, but as many of you have mentioned if the cattle industry, like any business, is still subject to the basic economics of supply-and-demand.

So, my question really is this. How do we ensure that taxpayer dollars create the maximum shackle space possible? In other words, how do we spend these dollars the most efficiently to move the needle, so to speak?

Drs. Lusk and Jacobs, Dr. Jacobs first, and then maybe Dr. Lusk, if you would weigh in on that, I would appreciate it.

Dr. JACOBS. Yes, thank you.

These investments, I think in my testimony, what I would say is that I think these investments should perhaps think about focusing more on the indirect investment. So, direct investment in shackle space. Unless we know, for example, that that gets these processors, these small and medium to a point where they can be profitable on their own without the support and without the subsidization, I would question that. And that is why I think a study is needed to understand what are the minimum capacity requirements to get these processors get small- and medium-scale—in other words, what is medium-scale? What gets them to a minimum efficient scale where they can be profitable, apart from subsidization?

I do support the indirect investments and things like workforce development, ensuring we have the right policies in place. Making sure that the playing field is level in terms of regulatory burden and regulatory requirements, but short of that, investments in shackle space are one-time—it is a one-time shot in the arm and I would want to make sure that that could be sustainable beyond any investment period.

Mr. MANN. Great, thank you.

Anything to add to that or any different perspective, Dr. Lusk?

Dr. LUSK. Yes. First, I appreciate the question to think about using taxpayer dollars wisely and efficiently, and I would agree with Dr. Jacobs. The things that really come to mind is what do you do to increase the size of the pie to improve that overall demand? So, some of it is market access issues increase that size of the pie by having access to more consumers in different parts of the world, or to improve quality, improve what consumers are willing to pay. That has a longer run benefit for the entire supply chain.

The other aspect, too, I think is innovation, productivity, improving innovation. Some of that—we have talked about the labor issues. That is a way to improve capacity, effective capacity is maybe some automation there, but also just efficiency. I think there is, again, beef cattle is in competition with a variety of other food stuffs, and we are in competition with producers all across the world for a place on consumers' dinner plates. And so, we have to continue to find ways to be more efficient, make responsible use of our natural resources.

Mr. MANN. I agree.

My last question will be for Dr. Aherin. Your testimony suggested that there is an exceptionally high likelihood that cow-calf producers would receive a lower price for their cattle if the government would mandate certain required percentages of negotiated cash sales. Could you explain that more, and why do you believe that to be the case?

Dr. AHERIN. Certainly.

So, I think the first step is understanding the benefits that AMAs bring to the marketplace. As I have mentioned both in testimony and an earlier question, AMAs allow packers and cattle feeders to both reduce their supply chain risks, better manage inventory, better utilize their cattle feeding and cattle processing capacity, and reduce their marketing and procurement costs. Both of those sectors of the beef industry are margin operators, so the price that they are willing to pay for the upstream input into their production system is very much determined by what their operating costs are. If we increase operating costs at the packer level, packers are likely to pay less for fed cattle. If we reduce the price of fed cattle and increase the operating costs of feedlots, then they are likely to pay less for calves and feeder cattle.

So, I readily admit that price discovery is necessary, but we have to recognize that it does have a cost and if we eliminate or reduce the benefits of AMAs, that also has a cost, and with cow-calf producers being primary producers and not margin operators, they have no one else to pass on the burden of that cost.

Mr. MANN. Thank you all. I see my time has expired, so I yield back. Thank you.

Ms. SPANBERGER. Thank you.

Before we adjourn today, I invite the Ranking Member to share any closing comments that he may have.

Mr. JOHNSON. Well, I think this has been remarkable, and I just want to focus on three things quickly. First off, there are hopeful signs in this market. We have future prices trending up, but even more importantly than that, longer-term we have all kinds of macro factors that will contribute to upward pressure on price for producers, and should exert some downward pressure on price for consumers. And I think the extent that we can get that done in a sustainable way, that could be tremendously good news.

The second thing I want to point out is the reason that this hearing has been so remarkable—and the acting chair and I were just talking about this—there has been a tremendous amount of bipartisanship. There is a legitimate search for policy solutions, rather than just the two sides throwing bumper sticker slogans at one another. There has been a real passion. So many of these Members have real-life experience with these issues. And then finally, there is also real knowledge. I mean, Congress works best when Members wade into areas that they understand and that they have taken the time to fully comprehend.

And so, I would just close, Madam Chair, by saying this. Not only are the signs hopeful, not only has this been a great hearing, but to the extent that we can continue those four major concepts of bipartisanship, search for truth, passion, and knowledge, I think the outlook is going to be better yet for cattle producers and for consumers, and that is awfully good news in my mind.

Thank you, and I yield back.

Ms. SPANBERGER. Thank you very much, Mr. Johnson.

And at this time, votes have been called and at this time, the Subcommittee will stand in recess, subject to the call of the chair.

[Recess.]

The CHAIRMAN [presiding.] Well, clearly the talented group of Members of this Subcommittee have done well without me, and I thank them.

Are there any further questions? Have our—okay. So, shoot. I had one more question I wanted to ask. Actually, I think I see the witness I wanted to ask this to.

Dr. Jacobs, are you there?

Dr. JACOBS. I am.

The CHAIRMAN. Question, and I was going over this with my colleague here from South Dakota. The landscape for over 100 years in American agriculture has seen the success in co-ops in a whole host of regions and different areas, but it doesn't seem to me that co-ops have really established themselves within the beef industry, the cattle industry. I am wondering if you have any thoughts about that, based upon your own experience and research with co-ops, why that has not been the case, and whether you think that is consistent or not?

Dr. JACOBS. That is a great question, and that is something that I have spoken with colleagues about. You are right. If you look across many of the sectors within ag, dairy, fruit, nuts, the list goes

on and on, juices. We do see farmer-owned cooperatives playing major parts in those landscapes, grain marketing included. And we do have a couple examples, like Country National Beef, Grassroots Farmers Co-op in Buckeye Valley. These aren't large-scale cooperatives, and the question you ask is a good one. Like why don't we see producer ownership along the supply chain—further along the supply chain in a major way in beef? And I think the answer comes down to the enormous capital investment it requires. That is what I come back to, and over time, the landscape has changed such that and there has been concentration such that producers who try to form now are really starting a foot race much later in the game.

And so, that is the only explanation I would have for that. I am sure there are other reasons, but I think that concentration happened early and for factors that I am not prepared to talk about or an expert to talk about, but I think it has a lot to do with the enormous capital that is required in this industry.

The CHAIRMAN. Well, thank you. All of our time has expired, and I think we have had an excellent panel of witnesses this morning, and we thank you for your time and your effort. I want to thank my—the Ranking Member, the gentleman from South Dakota, my friend, and we are going to continue to work together with this Subcommittee over the course of this session and the rest of this year to make sure that our efforts are productive and reflective of the needs of the livestock needs throughout our country, and also dealing with issues of foreign agriculture.

So, thank you all. I want to say that, frankly, the beef supply chain is heavily dependent upon having an important processing capacity to operate efficiently. We have talked about it this morning, innovative ways to protect and adapt the supply chain to new realities. We have talked about that. I farm in the Fresno, California area, but I don't farm the way my father did, nor my grandfather. I think that the innovation that we see in American agriculture for over 245 years is a great part of its success. There will be externalities such as wildfires or droughts like we are facing in the West. In California, 50 of the state's 58 counties are under drought emergency. But disasters we know are frequent, whether they be floods along the Mississippi River, or whether hurricanes in the South, and clearly with climate change, these factors, these weather factors are more constant and we have to look at how we provide a resilient supply chain and sufficient processing capacity to factor in.

So, there are a lot of things we got to do, we got to consider. The Ranking Member and I have talked about ways in which we can work smarter and strategically that will enable us to foster a more shock-resilient supply chain, because as we learned in this pandemic, you turn that supply chain upside down and it has significant, significant ramifications, and also more volatility in the marketplace. And that doesn't help anybody, consumers who are all Americans, and our producers.

So, the chair will adjourn the Subcommittee. Under the Rules, the record of today's hearing will remain open for 10 calendar days to receive any additional material and supplementary written responses from witnesses to any question posed by a Member. That is an opportunity for all Members of the Subcommittee.

So, this hearing of the Subcommittee on Livestock and Foreign Agriculture is adjourned, and I want to thank the staff on the Majority and Minority side for making it a very productive Subcommittee hearing. Thank you very much.

[Whereupon, at 12:13 p.m., the Subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

SUBMITTED LETTER BY HON. JIM COSTA, A REPRESENTATIVE IN CONGRESS FROM CALIFORNIA

June 22, 2021

Hon. THOMAS J. VILSACK,
Secretary,
U.S. Department of Agriculture,
Washington, D.C.

Dear Secretary Vilsack:

As you are aware, the recent cyberattack on JBS, and the potential for future attacks like it, present a grave threat to the livestock and poultry supply chain and the entire U.S. food system. As Members of the U.S. House Agriculture Committee, we view this attack and its implications for supply chain security and resiliency as a top priority.

As you know, food security is national security. This maxim takes on further meaning in light of the rising threat of cyberattacks on critical U.S. industries as they fight to rebound from the impacts of the COVID–19 pandemic. JBS is the most recent and prominent example of a cyberattack in the food and agriculture sector, but according to ransomware experts, at least 40 food companies have been targeted by ransomware gangs over the last year.[1] These types of attacks, and the risks they pose to supply chain resiliency, are increasing and we need a coordinated response to prevent them.

To that end, we urge USDA to collaborate with industry, the intelligence community, and law enforcement agencies across the Federal Government to share intelligence on food and agriculture-specific cyberthreats, to ensure that industry is aware of best practices for preventing cyberattacks, and to execute a coordinated response to attacks such as this one. Additionally, we would also like to see USDA collaborate with the Department of Justice to recover the $11 million paid in ransom money that JBS was coerced into paying to bring their plants back online. Allowing perpetrators of attacks such as this one to achieve financial gain will only encourage further attacks.

When it comes to our food system, it is vital that we do not act in a reactionary way, but that our reactions inspire preventative measures to protect against future attacks. We were encouraged to see that the Department committed to spending $4 billion to address supply chain issues, and that you are co-chairing the White House Supply Chain Disruptions task force. It is our hope that overall cybersecurity will be prioritized, and we would like to see additional plans that specifically address the threat that cyberattacks pose to the livestock industry.

We look forward to working with you on this critical issue to ensure that America's food supply chains remain resilient and, at your convenience, would like to discuss how USDA is pursuing these matters.

Sincerely,

Hon. JIM COSTA
Member of Congress

Hon. DUSTY JOHNSON
Member of Congress

Hon. CHERI BUSTOS
Member of Congress

Hon. KAT CAMMACK
Member of Congress

Hon. GREGORIO KILILI CAMACHO SABLAN
Member of Congress

Hon. CYNTHIA AXNE
Member of Congress

[1] *https://www.npr.org/2021/06/03/1002819883/revil-a-notorious-ransomware-gang-was-behind-jbs-cyberattack-the-fbi-says.*

Hon. J. LUIS CORREA
Member of Congress

Hon. SALUD O. CARBAJAL
Member of Congress

Hon. ANN KIRKPATRICK
Member of Congress

Hon. BOBBY L. RUSH
Member of Congress

Hon. ANGIE CRAIG
Member of Congress

Hon. SANFORD D. BISHOP, JR.
Member of Congress

SUBMITTED LETTER BY HON. JIM COSTA, A REPRESENTATIVE IN CONGRESS FROM CALIFORNIA; ON BEHALF OF BILL BULLARD, CHIEF EXECUTIVE OFFICER, RANCHERS CATTLEMEN ACTION LEGAL FUND UNITED STOCKGROWERS OF AMERICA (R–CALF USA)

July 28, 2021

House Committee on Agriculture,
Subcommittee on Livestock and Foreign Agriculture,
Washington, D.C.

Dear Chairman Jim Costa, Ranking Member Dusty Johnson, and Members of the Subcommittee:

The Ranchers Cattlemen Action Legal Fund United Stockgrowers of America (R–CALF USA) appreciates this opportunity to present this written statement to the U.S. House Agriculture Committee Subcommittee on Livestock and Foreign Agriculture regarding its July 28, 2021 hearing on *State of the Beef Supply Chain: Shocks, Recovery, and Rebuilding.*

R–CALF USA is the largest U.S. trade association that exclusively represents United States cattle farmers and ranchers within the multi-segmented beef supply chain. Its thousands of members reside in 45 states and include cow-calf operators, cattle backgrounders and stockers, and feedlot owners. R–CALF USA also represents U.S. sheep producers.

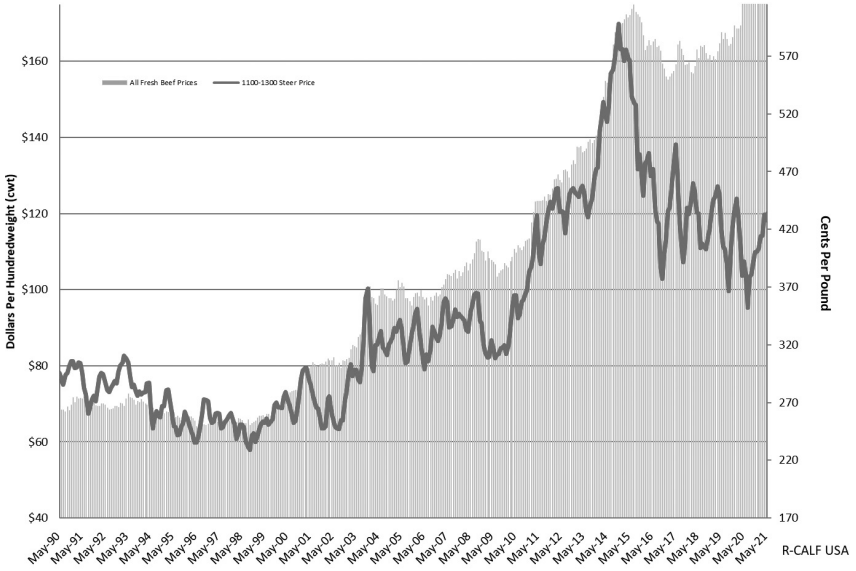
As depicted below in *Chart 1,* for ¼ century (1990–2015) there was a strong synchronous relationship between monthly fed cattle prices and monthly retail beef prices. Something—a glue of sorts—held this strong price relationship together over this considerable period despite the occurrence of exogenous factors such as drought, changes in cattle inventories, changes in feed costs, changes in currency valuations, changes in beef demand, and changes in the price of protein substitutes.

But no more. Beginning around the first of 2015, cattle prices inexplicably collapsed. And when the dust settled, monthly fed cattle prices and monthly retail beef prices began moving in opposite directions. That something—that glue of sorts—that long held the historically strong synchronous price relationship together had been vanquished.

Longer than 4 years after the 2015 manifest disconnect between fed cattle prices and retail beef prices, the nation's beef supply chain encountered its first of three major market shocks—the August 2019 temporary closure of a major beef packing plant in Holcomb, Kansas. This event highlighted the fragility of the beef supply chain that now lacks the glue that once held the supply chain together. The onset of COVID–19 in early 2020 was the second major shock, and it served to exacerbate the disastrous symptoms associated with the first shock. The third major shock, a cyberattack impacting one of the four largest beef packers, served to further highlight the systemic weakness of America's beef supply chain.

Chart 1

Historical Relationship Between Cattle Prices and Retail Beef Prices



Source: USDA Economic Research Service.

Everyone should now know that that something—that glue of sorts—that held the pricing relationship within the entire beef supply chain together was none other than competitive market forces. And since at least 2015, those competitive market forces have been purged from the beef supply chain.

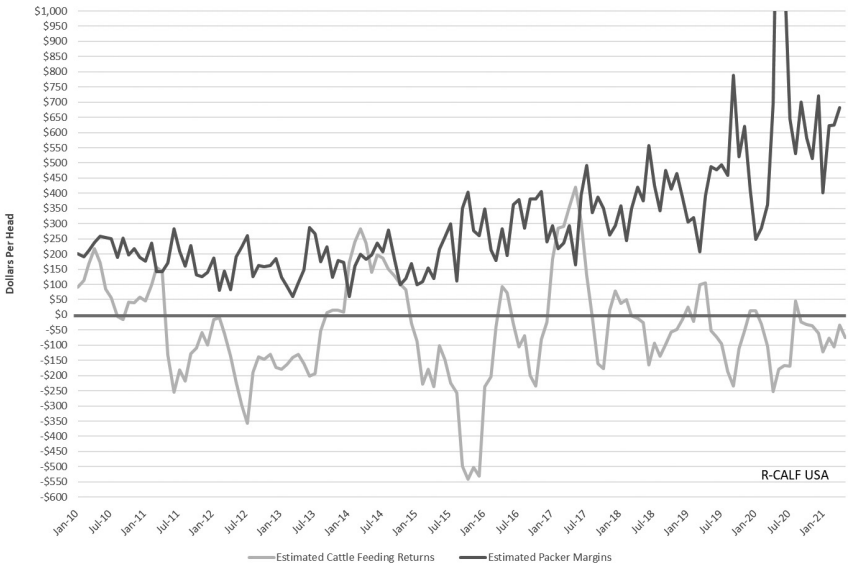
This is now an elephant in the room crisis that Congress must tackle with swift and decisive action. If not, we will soon witness a further acceleration of the already fast-shrinking domestic cattle industry, and we will witness it in months, not years. Many cattle producers, already suffering severely depressed cattle prices, now face unprecedented drought conditions. The situation is critical and America's family farm and ranch system of cattle production hangs in the balance.

Chart 2 below illustrates the financial harm accruing to the live cattle sector of the beef supply chain in a marketplace now void of competition. It depicts ever rising and unprecedented weekly beef packer margins beginning in 2015 while cattle feeders continually struggle to achieve monthly returns that would allow them to just break even.

Chart 2

Per Head Est. Packer Margins *vs.* Per Head Est. Cattle Feeding Returns

Based on 1,400 lb. Fed Steer



Data Source: USDA *Market News* MPR Datamart; USDA High Plains Cattle Feeding Simulator.

America's family farm and ranch system of cattle production cannot be sustained if the situation described above, *i.e.,* lack of competitive market forces resulting in systemic losses to the live cattle sector, is allowed to persist.

Congress has several options with which to address this acute problem: (1) It can address the core of the problem by taking decisive measures to reinsert competitive market forces where they have been purged from within the beef supply chain. (2) It can build, or cause to be built, an alternative beef processing infrastructure (*e.g.,* new and expanded local and regional packing plants) to compete against the existing beef processing infrastructure. (3) It can, of course, pursue a combination of the first two options.

R–CALF USA urges Congress to immediately pursue the first option as it holds the greatest potential to provide both immediate and permanent results. This is because a robustly competitive industry is inherently more sustainable than one propped up with government subsidies, as would be required under the second option.

Importantly, Congress must recognize a critical fact that can be deduced from *Chart 1* above. And that is that since 2015 consumers have demonstrated their willingness to pay more than enough for retail beef to have made everyone along the beef supply chain whole. The problem, therefore, is a supply-chain allocation of profits problem and it is competition itself that is best suited to correct it.

We recommend Congress implement two immediate triage measures for which to reinsert competitive market forces along and within the beef supply chain: (1) Force the concentrated beef packers to immediately begin competing for the available supply of cattle by requiring them to purchase at least half of their cattle needs in the negotiated cash market, which is the most important price discovery market for the entire live cattle industry. Bipartisan Senate Bill 949 sponsored by Senators Chuck Grassley and Jon Tester is the appropriate means with which to reinsert competition in the domestic cattle market. (2) Empower consumers to exercise choice in the retail marketplace by differentiating between beef produced exclusively from cattle born and raised by U.S. cattle farmers and ranchers and beef produced in whole or in part in foreign countries. New legislation to require all beef in U.S. commerce to be labeled as to where the animal was born, raised, and harvested—known as mandatory country-of-origin labeling (mCOOL), is the appropriate means with which to reinsert competition in the retail beef market.

Given the oligopolistic structure of the nation's beef packing industry, the forgoing recommendations must be viewed as merely the first step—the triage step—in restoring for consumers and cattle producers alike a more resilient and reliable domestic beef supply chain. The second step must address each transaction point along the entire beef supply chain where competition has been purged.

To accomplish this, Congress should enact legislation to reverse those non-competitive cattle procurement practices by the oligopolistic beef packers that have now become institutionalized under the misguided theory that efficiency trumps competition. Prohibiting packers from contracting for cattle without establishing a firm base price at the time of the agreement and banning packer ownership and control of cattle for more than 7 days before slaughter are two such legislative reversals of institutionalized cattle procurement practices that contribute greatly to the loss of competitive market forces within the beef supply chain.

Thank you for this opportunity to submit our written statement in the hearing record. We would appreciate the opportunity to meet with you and your staff for purposes of further examining America's beef supply chain and formulating a more comprehensive plan to improve it.

Sincerely,

BILL BULLARD, *CEO.*

SUBMITTED STATEMENTS BY HON. JIM COSTA, A REPRESENTATIVE IN CONGRESS FROM CALIFORNIA*

STATEMENT 1

ON BEHALF OF JULIE ANNA POTTS, PRESIDENT AND CHIEF EXECUTIVE OFFICER, NORTH AMERICAN MEAT INSTITUTE

On behalf of the North American Meat Institute (NAMI or the Meat Institute) based in Washington, D.C., and its 724 members around the country, thank you for the opportunity to submit this testimony.

The Meat Institute is the United States' oldest and largest trade association representing packers and processors of beef, pork, lamb, veal, turkey, and processed meat products. NAMI members include more than 350 meat packing and processing companies, large and small, and account for more than 95 percent of the United States' output of meat and 70 percent of turkey production. The Meat Institute provides legislative, regulatory, international affairs, public relations, technical, scientific, and educational services to the meat and poultry packing and processing industry.

On July 19, NAMI and eleven other organizations representing livestock producers, farmers and companies who produce the vast majority of America's meat, poultry, and dairy, as well as animal feed and ingredients, *unveiled the Protein PACT for the People, Animals, and Climate of Tomorrow.** The Protein PACT is the first joint initiative designed to accelerate momentum and verify progress toward global sustainable development goals across all animal protein sectors to ensure customers, consumers, and policy makers trust that meat aligns with their sustainability expectations. The Protein PACT has been submitted to the United Nations' (UN) Food Systems Summit as a sustainability game changer, and sustainable livestock and poultry production was featured in a side event at the Food Systems Summit ministerial in Rome on July 27.

Through the Protein PACT, Meat Institute members have developed robust metrics for continuous improvement that sustain healthy animals, thriving workers and communities, safe food, balanced diets, and the environment and align with the UNs' 2030 *Sustainable Development Goals.***

Claims about Increasing Consolidation and Concentration are Misplaced

Let me state at the outset, the members of the Meat Institute—and their livestock suppliers—benefit from, and depend on, a fair, transparent, and competitive market. This testimony is offered to provide a comprehensive picture of the dynamic, competitive market in which cattle producers and beef packers operate.

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* **Editor's note:** references annotated with (†) are retained in Committee file.
* *https://www.meatinstitute.org/ht/display/ReleaseDetails/i/192863/pid/287.*†
** *https://sdgs.un.org/goals.*

Much of the rhetoric about concentration in the beef packing sector wrongly implies that consolidation is on-going and that packers' market power is becoming more and more concentrated. That is not the case. The four-firm packer concentration ratio for fed cattle slaughter has not changed appreciably in more than 25 years. According to the Agricultural Marketing Service's (AMS) Packers and Stockyards Division (P&S), the four firm concentration ratio was 82 percent in 1994; today it is 85 percent.

The meat packing industry has been, and continues to be, one of the most highly scrutinized industries when it comes to antitrust review. P&S is uniquely charged, by statute, to provide on-going oversight for fair business practices and to ensure competitive markets in the livestock, meat, and poultry industries. Additionally, any potential merger or acquisition regulators believe threatens "too much market power" is subject to review by the Justice Department or the Federal Trade Commission. The last proposed merger of two of the "big four" fed cattle slaughterers occurred in 2008—and it was blocked by the Department of Justice.

Another clarification is needed. It is frequently claimed that the big four packers control 85 percent of beef production in the U.S. Again, that is not the case and a misleading exaggeration. Fed cattle make up 79 percent of the total cattle slaughter. Cows and other non-fed cattle, make up the balance, primarily slaughtered to be made into hamburger. The lean meat from these animals is a necessary ingredient to be made into America's supply of hamburger produced in combination with the less demanded muscle cuts from the fed cattle. This distinction is important because up to 50 percent of all beef in the U.S. is consumed as hamburger. Even factoring in the non-fed cattle slaughter plants they own; the four largest beef packers represent about 70 percent of total U.S. beef production.

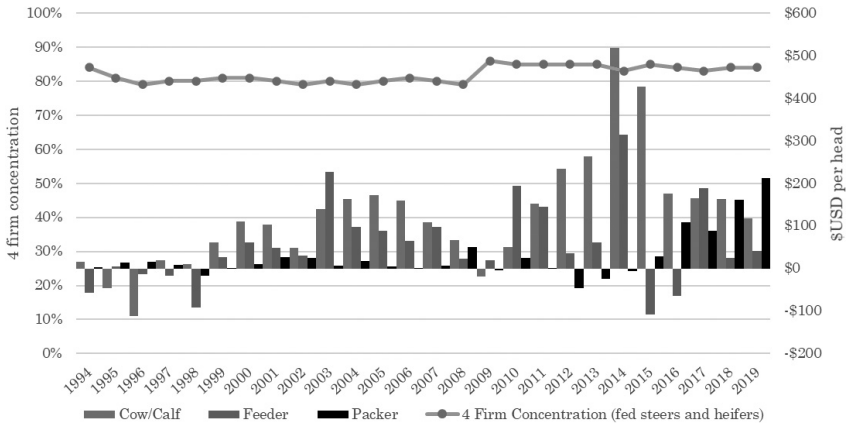
Critics of the industry frequently mistake individual packing plant size with overall industry concentration. The size and location of plants, however, reflect basic economic factors like the cattle supply and the economics of plant operations. Indeed, the cattle supply itself is concentrated. The farms and ranches that produce about ½ of all beef cattle in the U.S. are in just seven states. Further, more than 70 percent of all fed cattle are in just five states. Economies of scale drive the capacity and production of a packing plant. That is especially true in areas with large numbers of fed cattle.

Likewise, cow slaughter plants rely on a supply of cull cows from pasture-based cow-calf farms or dairy farms and are structured based on those factors. Each packing plant has its own cost structure. Packers bid on cattle based on the supply and demand factors in their own region. Owning a plant in Texas does not change the bottom-line to a company's operation in Iowa or Colorado.

Finally, given that the structure of the beef packing industry industry is driven by supply and demand factors, the false premise regarding concentration providing undue market power for beef packers must be corrected. The bottom-line is the current level of four-firm concentration has existed for more than 25 years and it has not ensured packer profitability at the expense of producers.

No sector—cow-calf, feedlot, nor packer—has realized positive margins every year. For example, the four-firm ratio in 2014, when cow-calf and feedlot margins were at record highs, was the same as in 2017 when all three sectors showed positive margins. However, over this 25 year timeline, the cow-calf sector incurred negative margins the fewest number of years of the three as the chart below shows.

Historical Margins Per Head by Sector *versus* Packer 4 Firm Concentration Ratio



Source: USDA Packers and Stockyards Division (concentration); Sterling Marketing (margin).

The U.S. Meat Industry is Efficient and Affords Americans the Benefit of Spending Less of their Personal Disposable Income on Food than any other Country in the World

Notwithstanding some popular perspectives being espoused about supply chains, particularly the meat the industry's response to significant "black swan" events, including the Holcomb packing plant fire, the recent cybersecurity attack, and the COVID–19 pandemic, the facts support the conclusion the industry proved resilient in extraordinary circumstances. One can argue the market worked as one would expect and suggestions that the government needs to step in and "do something" may be trying to fix something that is not broken.[1]

Before trying to "fix" something it is prudent to look back and acknowledge the benefits that flow from the system as it exists. In 2019, Americans spent an average of 9.5 percent of their disposable personal incomes on food-divided between food at home (4.9 percent) and food away from home (4.6 percent). Between 1960 and 1998, the share of disposable personal income spent on total food by Americans, on average, fell from 17.0 to 10.1 percent, driven by a declining share of income spent on food at home.[2] Indeed, Americans spend less of their disposable personal income on food than any other country in the world. This remarkable drop is attributable largely to systemic efficiencies that allow food processors to offer food to consumers at lower prices.

COVID–19 Affected the Cattle and Beef Markets

The COVID–19 pandemic was a shock to the meat supply chain, as it was for every industry in America. A brief review provides some instructive context for a discussion of cattle and beef markets during the pandemic. Meat was not the only item affected in the grocery store; we saw similar situations in everything from toilet paper, to disinfectants, to hand sanitizer.

Last year, pandemic-related plant interruptions temporarily idled about 40 percent of slaughter capacity for cattle and hogs at the peak of its impact. This disruption happened in tandem with unprecedented retail demand for beef due to panic buying and freezer stocking as shelter-in-place orders were put in place. The situation was worsened by the significant operational changes needed to rebalance production, processing, and distribution away from foodservice toward retail. The type of cuts, product sizes, processing equipment, packaging and distribution vary considerably between retail and foodservice and are not easily transitioned.

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[1] *Economic Reasons for What was Observed in Fed Cattle and Beef Markets During the Spring of 2020,* Steve Koontz, Department of Agricultural & Resource Economics, Colorado State University, May 28, 2020.†

[2] *https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/food-prices-and-spending/.*

The impact of the shift from foodservice to retail was substantial. Before the pandemic, in both 2018 and 2019, foodservice accounted for about 61 percent of all domestic beef consumption. That dropped to less than 55 percent in 2020. Conversely, retail sales of beef increased from 38 percent to 45 percent of overall domestic consumption.[3]

According to the Beef Checkoff,

> A major change in consumer behavior that affected the retail industry was the "stocking-up" behavior experienced at the beginning of the pandemic. Shoppers rushed to their grocery stores to buy surplus groceries, especially meat products. Even as late as September of last year, 50% of consumers surveyed reported to be "stocking-up" at a greater rate than normal. With this behavior, and with the foodservice industry restricted or shutdown, 83% of consumer meals were being cooked and consumed at home. Ground beef was one of the main products to be stored in refrigerators and freezers, with over 50% of consumers reporting to have surplus ground beef products.[4]

This had a dramatic impact. In 2020, retail beef sales increased by 606 million pounds by volume, or more than 11 percent. All fresh meat and poultry sales increased 19 percent by value, an increase of $9.6 billion. Beef sales increased by $5.9 billion in value, accounting for 61 percent of that overall growth in protein demand. Ground beef sales alone grew by $2.02 billion,[1] accounting for 21 percent of the total increased aggregate demand for meat and poultry. Beef demand remains high: the total volume of beef sales in 2021 from January through mid-June remained more than four percent higher than the pre-pandemic levels over the same period in 2019. This increase in beef demand in 2020 happened while the packing sector's ability to process cattle was experiencing operational constraints, and has continued into this year while labor availability has similarly affected the packing industry's ability to operate at full capacity. Meanwhile, the supply of fed cattle remained large. In short, COVID–19 created a significant "kink in the chain" that took time to straighten.

Early in the pandemic the National Cattlemen's Beef Association (NCBA) commissioned the Oklahoma Cooperative Extension Service and several distinguished agricultural economists to examine the impact COVID–19 was having and was expected to have on the beef cattle industry. That paper warned "the timeline for market recovery from COVID–19 is unknown, and cow-calf losses could expand into 2021 when the summer and fall 2020 calf crops would be marketed."[5]

The market is rebounding. This week Feeder Cattle futures reached contract highs for the August through March 2022 contracts. On Monday, July 26, the Feeder Cattle contract closed at its highest since March 2016. Live Cattle futures prices so far in July have averaged higher than the same month in 2017, 2018, and 2019, all pre-pandemic. This reflects a smaller supply of cattle, which according to USDA's mid-year cattle inventory report released last week, is down 1 percent from last year. Also, it reflects the recovery in cattle processing capacity.

Fed Cattle Marketing and Price Discovery

From ranch to the slaughter plant rail, live cattle typically change ownership two to three times. Cow-calf producers market their cattle to feeders, or to backgrounders who in turn move those cattle to feeders, who then market to packers. The price for cattle at any of those three most common points of transactions is a function of how many cattle are in each respective market segment. In other words, the price is determined by supply of cattle to sell from one segment and the demand for buying cattle by the next segment. That explains why each segment can experience different margins and why there is a futures contract for two types of cattle: feeder cattle and fed cattle. When any of those segments are out of balance, prices move, and the moves can be dramatic, as witnessed by the COVID-spurred retail beef demand, which represents the final segment of the entire pasture to plate value chain, and the COVID-imposed imbalance within various segments of the cattle sector.

Considerable attention has been focused on packer margins hitting historic levels during COVID, and before that, after the 2019 fire at the beef packing plant in Hol-

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[3] Nielsen, *Answers on Demand, 2020 Beef Sales;* NPD Category Sizing.

[4] Beef Checkoff, *Hindsight 2020: Retail and Foodservice Trends Through the Pandemic* (*https://www.beefitswhatsfordinner.com/retail/sales-data-shopper-insights/pandemic-market-trends*), accessed July 2021.†

[1] *Id.* at 3.

[5] *Economic Damage to the U.S. Beef Cattle Industry due to COVID–19,* OSU/NCBA, April 2020.†

comb, Kansas (which happened right before Labor Day weekend, a point of high seasonal beef demand). These dramatic and unforeseen events put the cattle supply chain temporarily out of balance. In both cases due to a temporary loss of processing capacity, the interrupted demand for cattle led cash market fed cattle prices to fall, while the reduced and uncertain supply of beef led wholesale beef prices to rise dramatically.

In his analysis of the COVID situation, Dr. Steve Koontz of Colorado State University wrote,

> To expect historical relationships between meat price and livestock prices to persist when major facilities in the packing sector are at times closed and in others operating at reduced capacity has no economic foundation.[6]

Nonetheless, calls for investigations into market transparency, collusion, and the structure of the beef packing industry were made. In August 2019 USDA announced its intent to investigate the economic impact to the cattle market stemming from losing beef processing capacity after the fire at the Holcomb slaughter facility. In April 2020 that investigation was expanded to include the impact of COVID–19 to "determine if there is any evidence of price manipulation, collusion, restrictions of competition or other unfair practices."[7]

In July 2020, USDA's AMS released its *Boxed Beef and Fed Cattle Price Spread Investigation Report* detailing the agency's investigation into cattle and beef price margins, finding no wrong-doing and confirming the disruption in the beef markets was due to devastating and unprecedented events.

Further, per that report, AMS related "One of the underlying concerns about price discovery is the declining number of participants in the negotiated cash market."[8] Since then, there have been several proposals, including legislation introduced in Congress, to restructure and regulate the cattle market through significant government intervention. Prominent among the proposals is to require cattle feeders to sell cattle to packers, and packers to buy from feeders, a mandatory minimum volume of fed cattle on a cash, spot market basis, or "negotiated" basis purportedly to improve price discovery. These proposals, however, threaten the industry with numerous adverse, unintended consequences.

There is robust price discovery in the cattle and beef markets. Congress established and USDA administers the Livestock Mandatory Reporting Act (LMR) program to facilitate open, transparent price discovery and provide all market participants, both large and small, with comparable levels of market information for slaughter cattle and beef, as well as other species.

Under LMR, packers must report to AMS daily the prices they pay to procure cattle, as well as other information, including slaughter data for cattle harvested during a specified time period and with net prices, actual weights, dressing percentages, percent of beef grading Choice, and price ranges, and then AMS publishes the anonymized data. AMS publishes 24 daily and 20 weekly cattle reports each week. Weekly reports start Monday afternoon and end the next Monday morning. These reports cover time periods, regions, and activities and the data include actual cattle prices.

Further, packers report all original sale beef transactions in both volume and price through the *Daily Boxed Beef Report.* This data is reported *twice* daily, at 11:00 a.m. and at 3:00 p.m. Central Time. The morning report covers market activity since 1:30 p.m. of the prior business day until 9:30 a.m. of the current business day. The afternoon report is cumulative, including all market activity in the morning plus all additional transactions between 9:30 a.m. and 1:30 p.m., and is on the USDA DataMart website. The boxed beef report covers both individual beef item sales and beef cutout values and current volumes, both of which are derived from the individual beef item sales data.

Stepping back for a moment, it is unimaginable in virtually any other industry participants in a free market would be required to report such data on an on-going, daily basis, and that the data would then be published by the government for competitors and other market participants to view, analyze, and use as a basis for strategic decisions. And yet, despite all of the onerous, mandated reporting requirements already in place, some people claim there is no market transparency and there needs to be more price discovery. Where does it end?

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[6] Koontz.†

[7] *USDA Statement on Beef Processing Facility in Holcomb* (*https://www.usda.gov/media/press-releases/2019/08/28/secretary-perdue-statement-beef-processing-facility-holcomb-kansas*),† Kansas, August 28, 2019.

[8] *Boxed Beef and Fed Cattle Price Spread Investigation Report* (*https://www.ams.usda.gov/sites/default/files/media/CattleandBeefPriceMarginReport.pdf*),† USDA AMS, July 22, 2020.

The proposals to implement a mandatory minimum volume of negotiated cash sales go far beyond the purported objective of market transparency and price discovery to regulating terms of sale in a private transaction between producers and packers. They represent the beginning of the Federal Government regulating more—or all—terms of sale in the cattle market. Such behavior should be concerning to producers given the number of transactions among the segments of the cattle production supply chain described earlier.

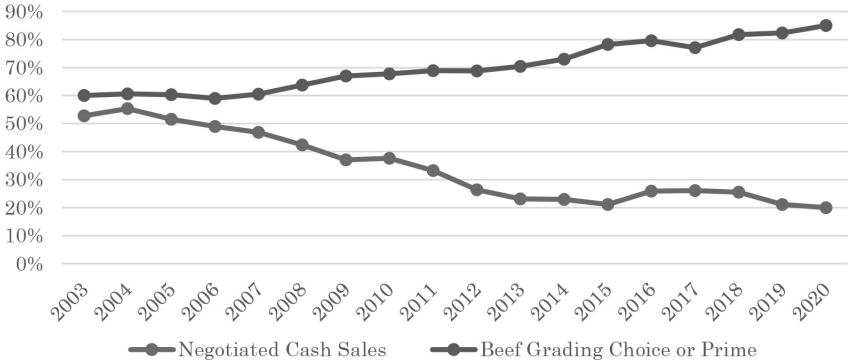
Further, there have been suggestions Congress should amend the confidentiality provisions in the Agricultural Marketing Act applicable to LMR. One bill has been introduced that would prohibit USDA from withholding any "information, statistics, and documents." This concept has data privacy and antitrust implications for both packers and feeders. USDA has examined the LMR confidentiality requirements and determined relaxing the requirements would not ensure anonymity among the market participants. Producers are not the only market participants using the published LMR data: packers and others constantly analyze the data, and any loosening of the confidentiality requirements could provide some market participants full view of their competitors' actions in the market.

By design, a mandate for packers to meet a minimum volume of negotiated cash sales would limit a producer's ability to use other, preferred types of cattle procurement and marketing tools, including forward contracts and various formula-based purchases that comprise the majority of transactions for market-ready cattle. These pricing methods—collectively known as alternative marketing arrangements (AMAs)—combined with the negotiated cash market pricing, have served U.S. cattle producers, the beef industry, and consumers well over the past 2 decades by:

- Providing producers and cattle feeders with an effective risk management tool;
- Reducing marketing costs for cattle feeders and producers;
- Improving efficiency though the supply chain;
- Improving the quality of U.S. beef;
- Meeting U.S. consumer demand and building trust by incentivizing not only quality, but the safety, sustainability, and consistency of U.S. beef; and
- Enhancing the competitiveness of U.S. beef in global export markets.

Greater utilization of AMAs has coincided with a significant improvement in beef quality. The percent of beef grading at the top two levels, Choice and Prime, has increased from 60 percent in 2000 to 85 percent in 2020.

Negotiated Sales *versus* Beef Quality Grade



Source: AMS.

There are economic and business reasons why cattle transactions have evolved in the way they have. In its 2018 Report to Congress, AMS said "Stakeholders were in general agreement that formula-based purchases provide greater benefits, in terms of operational efficiency, for both packers and feedlots."[9] Proponents of mandatory negotiated cash sale volumes have not acknowledged, much less addressed, fundamental questions such as which producers would be forced to give up their AMAs, and what effect on beef quality and demand could result.

[9] Report to Congress, *Livestock Mandatory Reporting,*† USDA AMS, 2018.

Analysis of this impact has been done, however. The Research Triangle Institute (RTI) conducted the definitive study about the use of and benefits that flow to all sectors regarding AMAs.[10] The study was mandated and funded by Congress, published in six volumes, by 30 researchers in four teams, conducting nearly 3 years of research and was peer reviewed. In the executive summary RTI said:

> Many meat packers and livestock producers obtain benefits through the use of AMAs, including management of costs, management of risk (market access and price risk), and assurance of quality and consistency of quality.[11]

RTI also concluded:

> In aggregate, restrictions on the use of AMAs for sale of livestock to meat packers would have negative economic effects on livestock producers, meat packers, and consumers.[12]

RTI also found, for cattle, that

> Hypothetical reductions in AMAs, as represented by formula arrangements (marketing agreements and forward contracts) and packer ownership, are found to have a negative effect on producer and consumer surplus measures. . . . Over 10 years, a hypothetical 25% restriction in AMA volumes resulted in a decrease in cumulative present value of surplus of
>
> - 2.67% for feeder cattle producers;
> - 1.35% for fed cattle producers;
> - 0.86% for wholesale beef producers (packers); and
> - 0.83% for beef consumers.
>
> A hypothetical 100% restriction in AMA volumes resulted in a decrease in cumulative present value surplus of
>
> - 15.96% for feeder cattle producers;
> - 7.82% for fed cattle producers;
> - 5.24% for wholesale beef producers (packers); and
> - 4.56% for beef consumers.[13]

Finally, "price discovery" should not be confused with price determination, *i.e.,* supply and demand fundamentals. Typically, when market prices are low or falling, there are increased concerns expressed about "price discovery." There appears to be a widespread perception that a reduction in cash trade is, by definition, bearish. In fact, in times of market disruption, formula and contract pricing can prevent precipitous drops and support quicker recovery. From an economic perspective, bearish cattle prices result from "price determination" factors, such as supply of cattle in each segment of the supply chain and the capacity to process cattle into beef, but also the overall demand for beef and other competing proteins.

Mandating more cash purchases does nothing to remedy bearish price fundamentals. The volume of cash sales is less relevant than is the type and quality characteristics of the cattle sold being representative of the market. Additionally, the types of cattle transactions vary greatly over time, even week to week. Imposing mandatory minimum volumes creates an incentive to alter transaction types that could result in less price discovery.

Supply and Demand Fundamentals Are at Work

Before the pandemic, the supply of cattle was growing. For the first 3 months of 2020, the fed cattle supply experienced year-over-year growth. For each month—January, February, and March—the number of cattle and calves in feedlots with capacity of 1,000 or more head was larger than it was during the same months in 2019. The supply of fed market cattle remains high this year. USDA reports that in 2021, the cattle-on-feed inventory has been the second highest monthly total ever on record for 4 of the first 6 months of the year, February through June 2021.

As expected, when supplies of cattle increase, prices decrease—and *vice versa.* The chart below shows how this has played out over the past 10 years, with or without

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[10] See United States Dept. of Agriculture. Grain Inspection, Packers and Stockyard Administration. *GIPSA Livestock and Meat Marketing Study.*† Vol. 1. Research Triangle Park: RTI International, 2007.

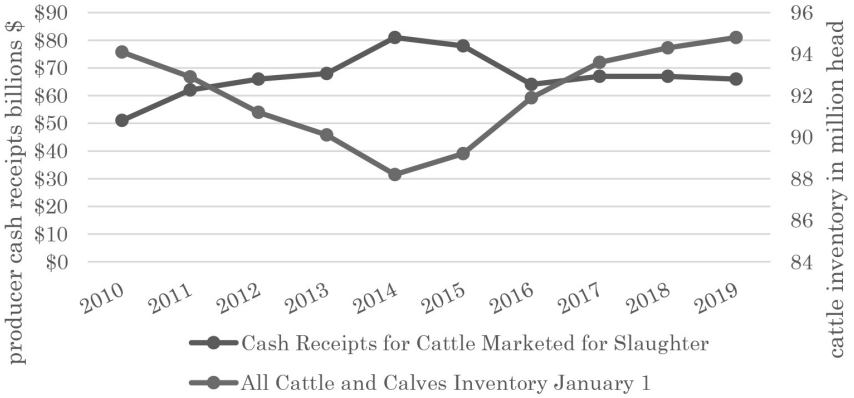
[11] *Id.* at ES–3.

[12] *Id.*

[13] *Id.* at ES–8–9.

such significant "black swan" events as COVID, the fire at the Holcomb packing plant in 2019, or this year's cyber ransomware attack.

Cattle Market Supply and Demand

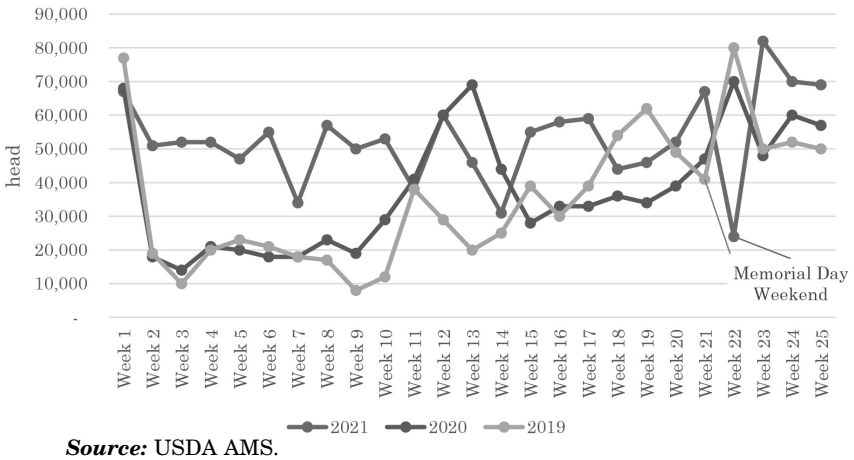


Source: USDA AMS.

Nonetheless, in the face of the many challenges, the beef packing sector has proven resilient. Total beef production in 2020 was slightly higher than 2019, based on heavier slaughter and carcass weights. As expected, cattle weights increased during the disruptions from COVID. Total head of commercial slaughter in 2020 was down just two percent from 2019, despite the dramatic disruption to the cattle harvest during the second quarter of 2020 resulting from the pandemic.

Packers adjusted to the combination of the large supply of cattle and constraints on their capacity by increasing their Saturday slaughter and processing operations to increase through-put. Saturday slaughter year-to-date (through June 19, 2021) has been nearly 40 percent higher than 2020 and 50 percent higher than the more normal year of 2019.

Saturday Cattle Slaughter



Source: USDA AMS.

Although through the first half of 2021 there remained a large supply of fed cattle to be harvested, which affected cattle markets and prices, through June, year-to-date cattle slaughter is nearly six percent greater than the previous 5 year average for the same period.

The Labor Supply Affects Cattle Markets

Production in meat packing and processing plants are, in some respects, tied to the number of employees working the line. During the early phases of the COVID–

19 pandemic, employee absenteeism, whether due to contracting COVID–19, or being sent home with symptoms, or quarantined because of exposure, or simply because of apprehension of coming to work as seen in some locations, caused processing lines in some plants to slow. Additionally, many packers were further challenged by the hodge-podge of enforcement actions, however well-intentioned, taken at the state and local level.

Moreover, certain cuts of beef and pork require comparatively more labor to process compared to other cuts. These include boneless steaks, which are high value products in high demand. Labor shortages for fabricating these cuts exacerbate the economic impact on beef and cattle prices from plant slowdowns. A slowdown at any point in a beef packing plant creates a bottleneck through the whole plant. Meat and poultry companies are utilizing capacity to the best of their abilities with COVID protocol constraints still in place and despite significant labor challenges.

To be clear, labor challenges were not caused by the pandemic; COVID–19 only exacerbated the issue. The meat industry has been facing a labor shortage for some time, and it continues today. Indeed, the pace of Saturday shifts has also strained available labor and adds to processing costs. Recent press stories report the industry's recruitment efforts, including wage increases, signing bonuses, relocation bonuses, retention bonuses and generous benefits. This labor shortage impact is not only on processing lines but also warehouse workers, maintenance positions, and other jobs also critical to maintaining the supply chain.

Virtually none of the calls for government intervention into the market acknowledge or address labor availability, even though it is, and is likely to remain, a significant factor that affects utilization of capacity. Packers cannot work through large supplies of market-ready cattle when plants are not fully staffed with skilled labor.

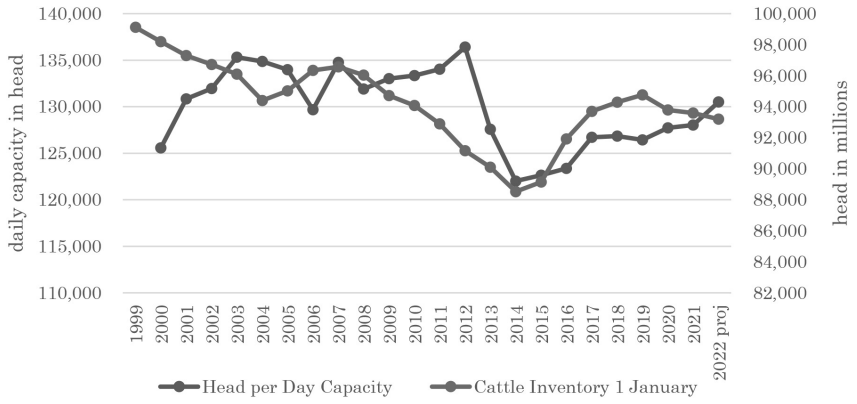
The Private-Sector is Adding Packing Capacity

USDA has announced it will provide $500 million in grants and loans from the American Rescue Plan to expand meat and poultry processing. Asking taxpayers to subsidize harvest capacity ignores two fundamental issues. First, adding more capacity simply for the sake of having added capacity for a notoriously cyclical cattle supply is short sighted and could distort more significant and longer-term private-sector investments. Second, adding capacity ignores the long-running challenge of finding a sufficient labor pool.

The beef and cattle markets are not static, but rather regularly adjust to find balance as the chart below shows. The industry responds to market signals in terms of capacity and the size of the cattle herd, and ultimately beef demand.

Daily Slaughter Capacity *versus* Cattle Inventory

*With 2022 Projections**



Publicly announced capacity expansions; cattle inventory implied from USDA May 2021* ***Livestock Dairy & Poultry Outlook.*

Over the past 10 months, in response to market signals, one new plant has opened, and several expansions and new facilities have been announced—including those with investment from cattle producer stakeholders.

2020–2021 Publicly Announced Beef Packing Capacity Expansion

Packer	Announced		Capacity *hd/day*	State	Est. Investment	Ownership	Est. on-line
	Date	Action					
AgriBeef/True West	Aug. 2020	New Plant	500	ID		Producer	TBD
FPL	Oct. 2020	Expansion	500	GA	$120 mln	FPL	Q4 2021
Iowa Premium/National Beef	Mar. 2021	Expansion	1,250	IA	$100 mln	National Beef	Q4 2022
Sustainable Beef	Mar. 2021	New Plant	1,400	NE	$300 mln	Feeder	TBD
Missouri Prime	Mar. 2021	Converted pork plant	500	MO		NexGen, feeders	Mar. 2021
JBS	Jun. 2021	Expansion	1,050	NE	$150 mln	JBS	Q4 2021
American Foods Group	Jun. 2021	New Plant	TBD	WI	AFG	TBD	
Total			**+5,200**				

Source: company press releases and news coverage.

These new entrants or company expansions were based on decisions to build or expand based on market conditions, not because of government intervention. Government interference into the market could well undermine this industry growth.

This market-based expansion of the beef packing industry is what cattle industry analysts have identified and called for in various reports. As a Rabobank analysis stated in September 2020, "An additional daily packing capacity of 5,000 to 6,000 head of fed cattle could restore the historical balance of fed cattle supplies and packing capacity and still allow for positive packer margins." [14] The Rabobank report further stated, "While many have discussed the need for more geographically dispersed, smaller plants, adding packing capacity in the name of supply chain resiliency is unlikely to work. It must be driven by long-run economics." [15] Dr. Koontz expressed similar concerns about building capacity that is not used when not needed but built "just in case." [16]

Small and midsize beef slaughter and processing companies endured the same challenges large companies faced during the pandemic, perhaps more so. Artificially creating more, smaller regional harvest facilities will not prevent future market disruptions nor protect cattle producers from cyclical or volatile markets. The unintended outcome could be the opposite.

Proposed Regulatory Actions by USDA Under the Packers and Stockyards Act will Adversely Affect Producers and Packers

On June 11, USDA announced it planned to propose rules to "strengthen enforcement" of the Packers and Stockyards Act (PSA).[17] The expected proposed regulations would be problematic for several reasons, including their impact on livestock producers' options to market their cattle, as described previously.

The concepts expressed in USDA's announcement are not new and were considered, and rejected, in the past. When proposed, they will conflict with legal precedent in no less than eight Federal appellate circuits, and will hurt livestock producers, packers, and consumers.

For example, USDA plans on re-proposing a rule to clarify that a plaintiff need not demonstrate harm to competition to bring and prevail in Packers and Stockyards Act litigation. Additionally, USDA indicates that it intends to "propose a new rule that will provide greater clarity to strengthen enforcement of unfair and deceptive practices, undue preferences, and unjust prejudices." [18] It is beyond dispute that eliminating the need for a plaintiff to show harm to competition, or likely harm to competition, will encourage litigation, most of it likely specious litigation. That threat will severely limit or terminate AMAs with all the adverse unintended consequences discussed.

Protecting Federal Meat Inspection: The Gold Standard of Food Safety

Under the guise of "increasing capacity," there are various legislative proposals to allow the shipment of state-inspected meat and poultry products across state lines without meeting Federal standards, and even allowing uninspected meat from custom processors to be sold commercially intrastate. These ideas are ill-conceived.

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[14] *The Case for Capacity; Can the U.S. Beef Industry Expand Packing Capacity?* Rabobank, Sept. 2020.

[15] *Ibid.*

[16] *Economic Reasons for What was Observed in Fed Cattle and Beef Markets During the Spring of 2020,* Steve Koontz, Department of Agricultural & Resource Economics, Colorado State University, May 28, 2020.

[17] *https://www.usda.gov/media/press-releases/2021/06/11/usda-begin-work-strengthen-enforcement-packers-and-stockyards-act.*†

[18] *Ibid.*

Federal inspection is a food safety issue, and food security is not something to be waived for a short run economic inducement. Any company wishing to sell in interstate commerce should be willing and able to meet the food safety and other consumer protection standards set by the Food Safety and Inspection Service (FSIS).

First, these bills ignore the fact that there already exists a program, administered by FSIS, that allows state-inspected establishments to ship meat and poultry products across state lines—the Cooperative Interstate Shipment (CIS) program. Nine states have elected to participate in the program, with two of those nine, Iowa and South Dakota, announced during the COVID–19 pandemic. CIS was created by Congress as part of the 2008 Farm Bill and ensures product moving in interstate commerce meets the requisite food safety standards. CIS also ensures a level playing field for all meat and poultry companies selling product in interstate commerce.

Second, the assertion that meeting Federal standards is too burdensome for small and very small plants is a specious argument. There are approximately 6,000 federally inspected meat and poultry establishments and more than 5,000 of them are small or very small.

Size of Facilities	Number of Federally Inspected Plants
Small (more than 10 but fewer than 500 employees)	2,329
Very Small (fewer than 10 employees or less than $2.5M in annual sales)	2,866

Source: FSIS.

Allowing interstate shipment of state-inspected meat opens a Pandora's Box of potential trade concerns. Under World Trade Organization (WTO) rules requiring "like treatment," the U.S. could be forced to accept imported meat and poultry regulated under local and provincial rules in foreign countries rather than the audited and verified national inspection systems in those countries, as required. Moreover, important export markets, which have their own national inspection systems could deny market access to U.S. beef, pork, and poultry. Neither outcome is good.

Beef Imports and Country-of-Origin Labeling

Much like USDA's proposed rules, another issue settled legally and discredited economically has been revived: mandatory country-of-origin labeling (COOL). In four rulings, each of which the U.S. lost, the World Trade Organization concluded that COOL was discriminatory and illegal under WTO rules, and if left in place would have triggered more than $1 billion in retaliatory tariffs. That is why Congress repealed COOL for beef and pork in 2015. Despite COOL being in place the largest and fastest growth in beef imports was in 2014—which was the year the size of the U.S. cattle herd was at its lowest, as expected based on supply and demand fundamentals that drive the cattle and beef industry.

When COOL went into effect, per capita consumption of beef in the U.S. was 60.8 pounds; by the time COOL was repealed in 2015 beef consumption per capita had dropped to 53.8 pounds. As explained earlier, up to half of U.S. beef consumption is as hamburger and ground beef. Most of the beef imported into the U.S. is lean, grass-fed trim and lower value cuts, which supplements the beef from non-fed cattle making up 21 percent of annual slaughter as a necessary ingredient in into processed meat and ground beef. Because of this balance with imports, steaks, loins and higher value cuts are not forced into such lower value products, which helps support prices both domestically and through exports of U.S. beef. According to the U.S. Meat Export Federation, the per pound price of U.S. beef exports has averaged a 68¢ premium over the price of imports that go into lower value beef products.

Conclusion

The discussion above demonstrates that market fundamentals drive the cattle and beef markets and that what we have seen before and during the course of the pandemic was to be expected. The North American Meat Institute is prepared to discuss these issues and work with the Committee on the issues facing the industry. Thank you for the opportunity to provide this testimony.

STATEMENT 2

ON BEHALF OF NATIONAL CATTLEMEN'S BEEF ASSOCIATION

Introduction

On behalf of America's cattle producers, thank you for the opportunity to provide testimony as the Subcommittee examines the resiliency of the beef supply chain.

The National Cattlemen's Beef Association (NCBA) is the U.S. cattle and beef industry's oldest and largest trade association. In addition to our 25,000 direct members, NCBA represents forty-four state cattlemen's associations with collective memberships numbering some 175,000 cattle producers—each of whom has a voice in our grassroots policy-making process. It is important to note that well in excess of 90 percent of those members are family-owned business entities involved in the cow-calf, stocker/backgrounder, and feeding sectors of the supply chain. In other words, true ranchers and farmers.

In a grassroots membership base as diverse as ours, it necessarily follows that business models and opinions are equally diverse. Just as cattle production in the western United States is very different than in the Midwest or Southeast, so too are the methods by which our producers choose to market cattle between segments of the supply chain. Our role at NCBA is to facilitate a policy process that respects those differing perspectives, consults informed expertise, allows for robust discussion and debate, and ultimately arrives at policy positions that are representative of the entire industry. It is from this perspective, based upon that very grassroots policy-making process, that NCBA submits the following testimony to the hearing record.

Background

The present situation unfolding within the U.S. cattle markets is highly complex and multifaceted. Some of the underlying dynamics at play have been present in our industry for some time. Other factors have emerged more recently. Independent of the origins of the issues themselves, the present conversations on how best to address them were recently elevated as a result of two major events.

In August of 2019, a fire at Tyson Foods' Finney County beef plant in Holcomb, KS wreaked havoc upon the cattle markets. In the days following the fire, live cattle prices declined substantially while boxed beef values soared.[1] At the peak of this market volatility, the spread between fed cattle and boxed beef prices reached $67.17/cwt—at the time, the widest gap since records began under Livestock Mandatory Reporting (LMR).[2] While the supply shocks brought about by this "black swan" event created severe challenges for cattle producers, those hardships were dwarfed by those brought on by the COVID–19 pandemic.

As meatpacking plants began to temporarily close, whether due to isolated outbreaks of the virus or to comply with local public health orders, cattle supplies began to build up across all segments of the supply chain. At the height of the pandemic, the industry realized a roughly 40 percent decline in beef processing capacity utilization.[3] The resulting supply and demand dynamics showed similar results to the Holcomb fire: fed cattle prices fell by 18 percent and boxed beef prices skyrocketed 80 percent.[4] While the industry has made great strides toward recovery, the effects of COVID–19 are still being felt by cattle producers today.

Recent NCBA Engagement on Cattle Marketing

NCBA has maintained a standing Live Cattle Marketing Committee for many years, and often employs a working group of market participants, state affiliates, and outside experts to research specific issues and offer objective guidance that may be used in the development of NCBA policies. While a few outside observers have been critical of NCBA's approach and policies, we have remained committed to respecting the direction and intent passed by our tens of thousands of grassroots members through our policy process. To discount those voices around the country because they do not align with a specific regional or organizational view is tremendously disrespectful to the very family operations many claim to be speaking for.

Price Discovery

While declining levels of negotiated trade of fed cattle had already begun an industry-wide discussion on the subject of price discovery long before the Holcomb fire or COVID–19, these two major market disruptors underscored the urgency of this

[1] *Boxed Beef & Fed Cattle Price Spread Investigation Report.*† USDA–AMS: 2020.
[2] *Ibid.*
[3] *Ibid.*
[4] *Ibid.*

dialogue. In July 2020, NCBA's Live Cattle Marketing Committee met to discuss policy proposals as part of our organization's 2020 Summer Business Meeting. Producer leaders from more than forty state cattlemen's associations worked for more than 6 hours to craft a policy that would help resolve concerns about live cattle marketing issues and lead the industry toward more robust price discovery. The NCBA Committee considered several proposals, each aimed at encouraging greater volumes of cash cattle trade. After debate, the NCBA Committee recommended and the NCBA Board of Directors approved a policy that supports voluntary efforts to improve cash fed cattle trade with the potential for a legislative or regulatory solution in the future if robust regional cash trade numbers are not achieved.

As mandated by this member-passed policy, NCBA leadership appointed a subgroup of the Live Cattle Marketing Working Group to develop a framework by which NCBA would monitor negotiated trades and establish benchmarks of weekly negotiated trade volumes. In October of 2020, the group announced this plan and issued a report titled, "A Voluntary Approach to Achieve Robust Price Discovery in the Fed Cattle Market" (*Addendum 1*).

NCBA implemented this framework in January 2021. Since that time, cattle feeders within USDA's five major cattle feeding reporting regions (the "5-Area")[5] have responded to the need for more negotiated trade in order to improve price discovery at the fed cattle level. In an impressively short period of time, many cattle producers, particularly in the Texas-Oklahoma-New Mexico and Kansas regions, have adjusted longstanding business models to offer more cattle on a negotiated basis. In some cases, they have even done so against the indications of short-term market signals. As a result, negotiated trade volumes in the first quarter of 2021 increased against recent years (*Addendum 2*). Many analysts and agricultural economists have credited this rise to NCBA's voluntary efforts (*Addendum 3*). We recently concluded our analysis of negotiated trade throughout second quarter, and found that trend had continued. In fact, during 3 trading weeks in this period, all 5-Area regions exceeded negotiated trade volumes that current academic research indicates is necessary for "robust" price discovery[6] (*Addendum 4*). This is certainly a marked improvement from trends observed even 9 months ago, and cattle producers deserve high praise for this work. Unfortunately, some meatpackers have still not participated in negotiated trade at meaningful levels, jeopardizing the success of our framework and impeding price discovery for all market participants.

All transactions require both a willing buyer and a willing seller. As evidenced by the negotiated trade volumes exhibited in the first and second quarters, cattle producers have been willing to sell their cattle on a negotiated basis, rather than utilizing alternative marketing arrangements (AMAs) such as formulas and forward contracts. Still, some meatpackers have yet to demonstrate a serious commitment to purchasing cattle on a negotiated basis. NCBA recently completed the "packer participation silo" of our voluntary framework, which will allow us to gauge whether or not the largest meatpackers are participating in negotiated trade at sufficient levels.

To be clear, AMAs are very important in the fed cattle trade, and NCBA supports their continued use as they fit the unique business models of cattle producers. They allow cattlemen and women to earn premiums for higher quality cattle and mitigate risks associated with selling in the spot market. However, equally as important, is the price discovery derived from direct, buyer-seller negotiations. Just as NCBA and industry experts warn against a total rejection of AMAs, we also know that lack of participation in the negotiated market will similarly result in dire consequences for our industry. The benefits of AMAs cannot be allowed to come at the cost of robust price discovery. There must be a balance. That is why we continue to explore new means to encourage greater use of the cash market and negotiated grids through our voluntary framework.

While more improvements are still needed to achieve consistency, including adequate meatpacker participation in the negotiated market, these results are encouraging. As new and innovative price discovery tools continue to emerge, we are confident that transactional contribution to price discovery remains attainable in the very near future.

Market Transparency

Since enactment of the Livestock Mandatory Reporting Act in 1999 (P.L. 106–78), cattle producers have benefitted from the consistent and timely reporting of market

[5] Alphabetically, USDA's five LMR reporting regions are: Colorado, Iowa-Minnesota, Kansas, Nebraska, and Texas-Oklahoma-New Mexico.

[6] *Objective Measures of Price Discovery in Thinning Fed Cattle Markets.*† Colorado State University: 2016. (Executive Summary).

information by USDA. Producers utilize this information to make informed marketing decisions that best suit their unique business needs. LMR requires Congressional reauthorization every 5 years and was set to expire at the end of the 2020 Fiscal Year. A 1 year extension of the program was included in the Consolidated Appropriations Act of 2021 (P.L. 116–260), and it is currently authorized through September 30, 2021. NCBA strongly supports LMR and urges Congress to ensure that this critical tool does not expire.

Though LMR is essential to cattle producers, improvements could be made to the program to increase transparency within the cattle markets. Though many of these proposals can be adopted through the regulatory process, NCBA supports the establishment of a cattle contract library, reporting of formula base prices, and next-day carcass weight reporting among other things. We believe that these new reports could further benefit producers in marketing their cattle. USDA is required by law to protect the confidential business information of entities who report market information under LMR.[7] To implement this mandate, USDA established the "3/70/20" confidentiality guidelines in 2001. Under this provision, price reports are published provided each report meets three conditions over the most recent 60 day period:

(1) At least three reporting entities provide data at least 50 percent of the time;

(2) No single reporting entity provides more than 70 percent of the data for a report; and

(3) No single reporting entity may be the sole reporting entity for an individual report more than 20 percent of the time.

While NCBA recognizes the Agency's requirement to balance the need for information with safeguarding confidentiality, the 3/70/20 guidelines have often resulted in withheld reports throughout the major cattle feeding regions—most notably in the Colorado region. NCBA supports efforts to revisit confidentiality rules to reduce instances of nonreporting, and will continue to work alongside allies on Capitol Hill and with USDA to ensure this critical information remains accessible to cattle producers.

Processing Capacity

Adequate beef processing capacity is critical to maintaining profitability in the cattle industry and providing a steady supply of essential food products to American consumers. Currently, there is a serious shortage of processing capacity (commonly referred to as "hook space") throughout the beef production system. A recent study by Rabobank found that excess operational beef processing capacity—or hooks available in addition to those used to process existing fed cattle supplies—fell to zero in late 2016 and turned negative in early 2017. The same study found that, under the current dynamics of supply and demand, the industry could economically accommodate an additional 5,700 hooks of daily processing capacity. This equates to roughly 1.5 million additional animals per year.[8]

At present, the processing sector represents a bottleneck in the overall beef supply chain. The result has a negative effect on cattle producer leverage in fed cattle negotiations. When cattle supplies exceed the capacity to process them, the livestock become a less scarce resource and cattle prices decline. It is important to note that this is independent of demand for beef. Even when demand for U.S. beef is strong, a lack of processing capacity depresses prices for live cattle. The most pointed examples of this can be found in the Holcomb fire and COVID–19. In both cases, operational beef processing capacity utilization fell dramatically following temporary closures of high-throughput beef plants. As a result, cattle prices declined, and boxed beef values drastically increased.

To improve producer leverage in fed cattle negotiations, either cattle supplies must be reduced, or processing capacity must be expanded. Herd contractions and expansions occur naturally over the course of a somewhat predictable 10 year cycle. Currently, U.S. cattle inventories are cyclically high,[9] but beef demand is also high both domestically and in our major export markets.[10] The clearest solution to meeting this demand while fostering profitability throughout the supply chain is to expand beef processing capacity.

Meatpackers of all sizes face similar operational challenges, the most consistent and severe of which is labor recruitment and retention. The largest barrier to entry, however, is access to sufficient capital for construction. The industry average start-

[7] 7 U.S.C. § 1636(a).†
[8] Aherin, Dustin. *The Case for Capacity.* RaboBank: 2020.
[9] *Cattle Report,*† USDA–NASS, January 2021.
[10] *Factors that Drive Beef, Cattle Prices to Record Highs.* RaboBank: 2021.

up cost for a meat processing facility is roughly $100,000 per hook.[11] This means that a modest 25-head-per-day plant would need to secure $2.5 million in financing just to build the infrastructure. As a further complication, traditional lending institutions are often unable to provide adequate financing due to the risk profile assessed to meatpacking business models.

NCBA has partnered with lawmakers in Congress to introduce legislation authorizing federally guaranteed, low-interest loans to prospective meatpackers. We urge Congress to swiftly take up this legislation and vote yes to supporting small, local, and independent meat processors.

Market Oversight

Markets can only properly function when all participants play by the same rules. While much of the spread between boxed beef and fed cattle prices during the pandemic can be explained by the inherent characteristics of supply and demand, NCBA called upon the Department of Justice to investigate the major meatpackers in June 2020. The purpose of this request was to ensure that no anticompetitive behavior or illicit activity contributed to these disparate prices paid for similar commodities. To date, we have not learned the results of this investigation, nor have we received any confirmation that it is still ongoing. Over 100 lawmakers have signed onto letters requesting a status update from the Attorney General, and NCBA supported most of these efforts. It is imperative that cattle producers learn the Department's findings at the earliest possible opportunity. They deserve transparency and accountability.

NCBA Recommendations

Throughout cattle marketing conversations over the past sixteen months, a small but vocal minority has suggested—and continues to suggest—that low cattle prices can be remedied or balanced simply through a government mandated marketing requirement. This is not accurate. Definitively, there is no simple solution sufficient to address the myriad challenges facing our industry. To suggest that any single legislative, regulatory, or industry-led action will be a "silver bullet" is to grossly oversimplify and mislead. Rather, progress and marked improvement will require a multifaceted response from the industry, Congress, and Federal agencies.

In Congress, lawmakers should focus their efforts on bringing more transparency to the cattle marketplace, supporting small and mid-size beef packers, promoting expansion of processing capacity, ensuring a timely reauthorization of LMR, reviewing the confidentiality obligations required of USDA, and continuing oversight of the Department of Justice to ensure their ongoing investigation reaches a swift conclusion. NCBA is aware that a handful of lawmakers, are curious about legislation to require certain levels of negotiated trade, such as the *Cattle Market Transparency Act*[12] and legislation known as "50/14."[13] Per our member-driven, grassroots policy, NCBA opposes government mandates in the cattle market at this time. Our industry-led effort to achieve price discovery must be allowed the opportunity to succeed or fail before our membership decides to support a legislative or regulatory solution. Simply put, the midst of an ongoing market crisis is never a good time to make long-term, market altering statutory changes. Careful consideration must be given to the risk and reward of enacting market-influencing laws for hundreds of thousands of American ranchers and millions of avid beef consumers.

As Congress evaluates several legislative proposals intended to help cattle producers during these uncertain times, we urge thorough vetting and attentive evaluation of economic assessments and feedback from the entire cattle industry. As we have for over fifty years, NCBA is happy to assist the Subcommittee in this endeavor.

Conclusion

NCBA appreciates this opportunity to provide testimony on behalf of our members—the men and women who put beef on the American dinner plate. We commend and thank the Subcommittee for taking the time to delve into this important and complex subject. It has been a difficult 2 years for cattle producers in every corner of the country, and the Subcommittee's desire to assist them during this time has not gone unnoticed. Your attention to these issues is greatly appreciated. As we continue to discuss creative solutions and potential paths forwards, we stand ready to assist in any way. Please do not hesitate to reach out to the NCBA Center for Public Policy at (202) 347–0228 with any questions.

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[11] Newlin, Lacey. *So You Want to Build a Slaughter Plant?* HIGH PLAINS JOURNAL:† 2020
[12] S. 543 (117th Cong.).†
[13] S. 949 (117th Cong.).†

Addendum 1—Overview Presentation of NCBA's Voluntary Approach to Achieve Robust Price Discovery in the Fed Cattle Market

A Voluntary Framework to Achieve Robust Price Discovery in the Fed Cattle Market

Overview of the NCBA Live Cattle Marketing Working Group – Regional Triggers Subgroup Report Delivered October 1, 2020

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Subgroup Members

Jerry Bohn - NCBA President-Elect & Subgroup Chair
Kevin Buse, Texas Cattle Feeders Association
Shelby Horn, Texas & Southwestern Cattle Raisers Association
Brad Kooima, Iowa Cattlemen's Association
Jordan Levi, Colorado Livestock Association
Troy Sander, Kansas Livestock Association
Troy Stowater, Nebraska Cattlemen

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Excerpt: Fed Cattle Price Discovery Policy (M 1.10)

THEREFORE BE IT RESOLVED, NCBA supports a voluntary approach that:

1) Increases frequent and transparent negotiated trade to regionally sufficient level, to achieve robust price discovery determined by NCBA funded and directed research in all major cattle feeding regions, and

2) Includes triggers to be determined by a working group of NCBA producer leaders by October 1, 2020.

BE IT FURTHER RESOLVED, if the voluntary approach does not achieve robust price discovery as determined by NCBA funded and directed research, and meet the established triggers that increase frequent and transparent negotiated trade to a regionally sufficient level, and triggers are activated, NCBA will pursue a legislative or regulatory solution determined by the membership.

BE IT FURTHER RESOLVED, NCBA support a three-year review/sunset provision on any negotiated trade solutions implemented to allow for a thorough cost benefit analysis to be conducted.

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Regions

- In general, the subgroup will use the 5 USDA-AMS reporting regions
- Colorado combined with Nebraska to account for instances of nonreporting (NOTE: this is only for NCBA's internal analysis purposes, not a recommendation for changes to LMR or AMS reporting regions

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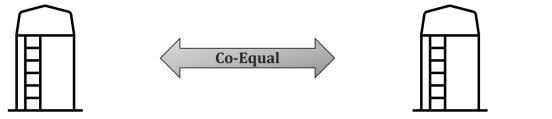
Trigger Silos

The subgroup believes that robust price discovery is determined by <u>both</u> sufficient levels of weekly negotiated trade and packer participation in such negotiated trade, and will evaluate each component in a co-equal trigger silo.



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Minor vs. Major Triggers

- There are a total of 8 minor triggers:
  - 4 regional <u>negotiated trade</u> obligations
  - 4 regional <u>packer participation</u> obligations
- In any given quarter, the tripping of 3 or more minor triggers shall constitute a major trigger

Example:

Texas-Oklahoma-New Mexico	
Negotiated Trade	**Packer Participation**
Obligation Met	Obligation Met

Nebraska-Colorado	
Negotiated Trade	**Packer Participation**
Obligation Met	Obligation Not Met

Iowa-Minnesota	
Negotiated Trade	**Packer Participation**
Obligation Met	Obligation Met

Kansas	
Negotiated Trade	**Packer Participation**
Obligation Not Met	Obligation Met

In this fictional example, only two minor triggers would have been tripped in the quarter being analyzed.

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The 75% Plan

On a quarterly basis, the subgroup will evaluate each region's performance for each trigger silo.

Evaluations will be based upon LMR data collected in arrears.

For each quarter, data will be organized in weekly increments

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The 75% Plan, cont.

To avoid tripping a major trigger, each region must:

1) Weekly trade 75% or more of its unique "robust" price discovery threshold via negotiated means, no less than 75% of the reporting weeks, and

2) Weekly fulfill its packer participation obligations (to be determined at a later date) no less than 75% of the reporting weeks

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The 75% Plan, cont.

- If a major trigger is tripped during any two out of four rolling quarters, the subgroup will recommend NCBA pursue legislative or regulatory measures to compel adequate negotiated trade for robust price discovery

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Negotiated Trade

- Defined as:

  A cash or spot market purchase of cattle by a packer or negotiation of a base price, from which premiums are added and discounts are subtracted.

- Includes negotiated cash and negotiated grid

- Use the regional negotiated trade volumes identified by Dr. Koontz at the "robust" levels

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Negotiated Trade, cont.

- Under the 75% Plan, each region must quarterly attain 75% of the Koontz “robust” negotiated trade number (at least 75% of the reporting weeks)

	NEGOTIATED TRADE	
REGION	KOONTZ "ROBUST" NUMBER (HD/WK)	Weekly Trade Obligation (75% of Robust)
Texas, Oklahoma, New Mexico	13,000	9,750
Kansas	21,000	15,750
Nebraska, Colorado	36,000	27,000
Iowa, Minnesota	16,000	12,000

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Packer Participation

- Each of the four major packers’ participation in negotiated trade, within each of the regions from which they predominantly procure cattle, will be monitored by the Subgroup
- Each major packer will be responsible to participate at adequate levels under this framework
- The data to measure this is not currently published by USDA-AMS
- NCBA currently in talks with AMS to access data in some form
- The subgroup is hopeful that a packer participation silo can be finalized in the coming weeks

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Implementation

- The framework will be implemented on January 1, 2021
- The first quarterly analysis will take place shortly after March 31, 2021
- If the packer participation silo is not complete, only the negotiated trade volume silo will be used in Q1

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Force Majeure

- The subgroup will evaluate "black swan" events on a case-by-case basis and will make trigger determinations accordingly
- Major supply chain disruptions may allow for flexibility within the 75% Plan.

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Review and Adjustment

- The framework will need to be adjusted from time to time to account for changing conditions of supply and demand, technological advancements, updated academic literature, etc.
- Such considerations will be made quarterly, and adjustments may be made accordingly
- This includes evaluations of the two out of four rolling quarters approach versus alternatives such as two quarters in a calendar year, or any two consecutive quarters

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Questions?

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Addendum 2—Letter from NCBA President Jerry Bohn to NCBA Members Regarding Q1 Results of Voluntary Price Discovery Efforts

April 16, 2021

Dear Fellow NCBA Member,

March 2021 marked 1 year since the declaration of a national emergency due to COVID–19. Nobody could have predicted then the serious impact the pandemic would have on our nation, the economy, or within the cattle markets. As states begin the process of fully re-opening, I am hopeful that the worst of this crisis is behind us. Although the business environment for cattle producers has improved since March 2020, the volatility caused by the virus continues to impact our industry.

To improve the business climate for cattle producers, further work is needed in the area of price discovery. Last October, you received a *letter* [1] from Marty Smith announcing NCBA's *Voluntary Approach to Achieve Price Discovery in the Fed Cattle*

[1] *https://policy.ncba.org/Media/Policy/Docs/regional-triggers-subgroup-report-letter-from-marty-to-ncba-membership-final_10-16-2020-38.pdf*.

Market.[2] This framework, sometimes called the "75% Plan," was developed by NCBA's Live Cattle Marketing Working Group Regional Triggers Subgroup as directed by the Fed Cattle Price Discovery policy (**M 1.10**) adopted at our 2020 Summer Business Meeting. As a reminder, the voluntary approach requires the subgroup to analyze the program's performance at the end of every quarter. The subgroup has completed its evaluation of the first quarter of 2021, and I write today to report their findings to the members of NCBA.

After evaluating the weekly USDA–AMS negotiated trade data in the five major cattle feeding reporting regions, the subgroup has determined that a major trigger was tripped during the first quarter of 2021. According to our member-approved framework, if another major trigger is tripped during any of the remaining quarters this year, NCBA will pursue a legislative or regulatory solution to increase negotiated trade as determined by our membership.

Under the "Negotiated Trade" silo of the 75% Plan, one minor trigger is assigned to each of the regions. The subgroup evaluated the weekly negotiated trade volumes for each cattle feeding region, and determined that the Iowa-Minnesota and Nebraska-Colorado regions exceeded their thresholds under the 75% Plan during all of the reporting weeks—therefore, passing their negotiated trade threshold for this quarter. They also found that the Texas-Oklahoma-New Mexico and Kansas regions each fell short of the threshold during five of the Q1 reporting weeks. One of those weeks occurred during Winter Storm Uri and another coincided with mandatory maintenance at a major packing plant which resulted in a lengthy closure. Both events disrupted normal cattle flows and brought critical packing capacity to a grinding halt. The data from the weeks surrounding both events justified invoking the *force majeure* provisions of our framework, though a major trigger was still tripped due to a lack of packer participation. The subgroup will continue to explore ways to evaluate *force majeure* events in a more objective manner.

Let me be clear, our producers deserve high praise for their diligent efforts to implement the voluntary framework this past quarter. They offered cattle on a negotiated basis to comply with our framework, even when market signals were telling them to hold on to cattle in anticipation of higher prices. Often, these trades were made at a loss. We recognize the steps cattle producers have taken to address the need for greater price discovery and market transparency, and deeply appreciate their actions. Unfortunately, there was not enough participation in the negotiated market from some of the packers. Simply put, feeders can offer all their cattle on a negotiated basis—but we only achieve our thresholds if there is a buyer willing to bid fairly on those cattle offered.

While the 75% Plan framework calls for the evaluation of a "Packer Participation" silo (in addition to the "Negotiated Trade" silo), this piece of the program is not yet complete, and thus was not evaluated during this quarter. NCBA continues to finalize the details with the four major meatpackers. While we are in the final stages of these negotiations, the basic mechanics have already been established by the subgroup—and we know that, had this silo been evaluated during the first quarter, we would have tripped a major trigger with the packer silo as well.

This quarter, the market fell short of the negotiated trade volumes outlined in our voluntary framework, but that should not overshadow the significant improvements made to price discovery since the framework's implementation. For example, negotiated trade activity is already up significantly year-over-year in the Texas-Oklahoma-New Mexico region.

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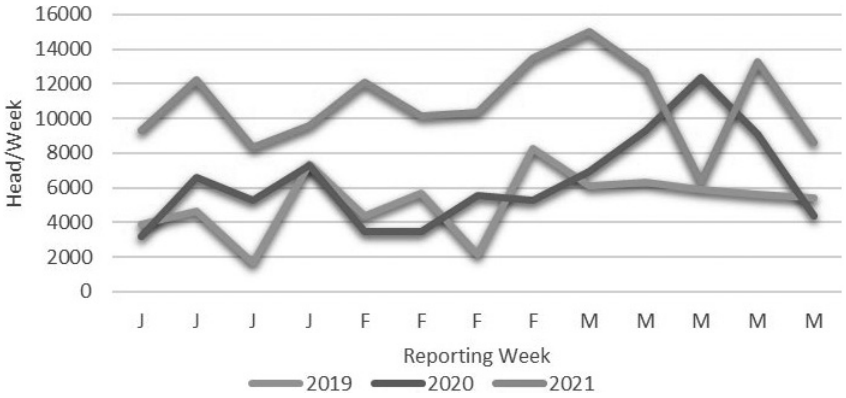
[2] *https://policy.ncba.org/Media/Policy/Docs/ncba-regional-triggers-subgroup-report-overview-presentation_10-16-2020-53.pdf.*

TX–OK–NM Negotiated Trade Volume



Source: CattleFax; USDA–AMS.

It is apparent that the work of NCBA, and the efforts of the producers who have participated in this framework, have been critical in this increase. These gains were made despite residual COVID–19 disruptions, packing plant closures, natural disasters, and a volatile market. Cattlemen and women should be commended for their efforts to bring more price discovery to the marketplace. But we still have a ways to go.

We remain committed to working with all levels of the supply chain to ensure more fed cattle are offered and procured on a negotiated basis. Please do not hesitate to reach out to your NCBA officer team or our staff in Washington, D.C., with any questions or concerns.

Sincerely,

JERRY BOHN,
President,
National Cattlemen's Beef Association.

Addendum 3—Q1 Negotiated Trade Volumes by 5-Area Region Compared to NCBA's 75% Thresholds

NCBA Fed Cattle Negotiated Trade Tracker—2021 Q1

Region	75% Threshold	Category	Week Ending: 1/10/2021	1/17/2021	1/24/2021	1/31/2021	2/7/2021	2/14/2021	2/21/2021	2/28/2021	3/7/2021	3/14/2021	3/21/2021	3/28/2021	4/4/2021
TX–OK–NM	9,750	*Neg. Cash*	7,239	7,331	4,988	6,800	6,929	6,441	6,390	8,376	8,742	6,669	2,774	8,657	4,642
		Neg. Grid Base	2,046	4,893	3,356	2,827	5,159	3,690	4,003	5,104	6,299	6,060	3,553	4,649	3,997
		Total Neg.	9,285	12,224	8,344	9,627	12,088	10,131	10,393	13,480	15,041	12,729	6,327	13,306	8,639
KS	15,750	*Neg. Cash*	13,754	12,481	20,591	10,598	18,085	8,531	8,310	10,830	14,859	17,952	13,259	17,093	13,486
		Neg. Grid Base	3,430	2,343	3,410	2,105	3,504	6,198	1,382	4,086	4,383	2,903	3,978	5,442	5,556
		Total Neg.	17,184	14,824	24,001	12,703	21,589	14,729	9,692	14,916	19,242	20,855	17,237	22,535	19,042
NE		*Neg. Cash*	23,816	31,081	29,738	30,547	30,312	25,664	25,512	29,886	19,807	34,422	22,850	30,549	21,930
		Neg. Grid Base	3,947	5,153	5,371	8,014	6,071	8,456	4,679	4,352	4,403	2,887	3,216	4,760	5,232
	27,000	*Subtotal Neg.*	27,763	36,234	35,109	38,561	36,383	34,120	30,191	34,238	24,210	37,309	26,066	35,309	27,162
CO *		*Neg. Cash*	1,573	5,485	2,419	4,333	—	—	—	—	5,422	4,083	5,097	6,311	728
		Neg. Grid Base	1,654	5,498	2,297	4,566	—	—	—	—	3,155	2,777	1,982	2,071	1,263
		Subtotal Neg.	3,227	10,983	4,716	8,899	—	—	—	—	8,577	6,860	7,079	8,382	1,991
		Total Neg.	30,990	47,217	39,825	47,460	36,383	34,120	30,191	34,238	32,787	44,169	33,145	43,691	29,153
IA–MN	12,000	*Neg. Cash*	19,414	27,355	18,887	24,220	26,081	21,443	20,342	18,668	19,844	18,875	26,397	21,961	26,291
		Neg. Grid Base	3,471	4,166	2,984	4,040	2,716	4,394	2,681	4,668	3,095	2,941	3,027	3,004	4,390
		Total Neg.	22,885	31,521	21,871	28,260	28,797	25,837	23,023	23,336	22,939	21,816	29,424	24,965	30,681
TX–OK–NM	9,750	*Pass/Fail*	(465)	2,474	(1,406)	(123)	2,338	381	643	3,730	5,291	2,979	(3,423)	3,556	(1,111)
KS	15,750	*Pass/Fail*	1,434	(926)	8,251	(3,047)	5,839	(1,021)	(6,058)	(834)	3,492	5,105	1,487	6,785	3,292
NE–CO	27,000	*Pass/Fail*	3,990	20,217	12,825	20,460	9,383	7,120	3,191	7,238	5,787	17,169	6,145	16,691	2,153
IA–MN	12,000	*Pass/Fail*	10,885	19,521	9,871	16,260	16,797	13,837	11,023	11,336	10,939	9,816	17,424	12,965	18,681

**Zeroed cells denote unavailability of data due to confidentiality.*

Sources:

Region:	USDA–AMS Report:
TX–OK–NM	*LM—CT156 (https://www.ams.usda.gov/mnreports/ams_2483.pdf)*
KS	*LM—CT157 (https://www.ams.usda.gov/mnreports/ams_2484.pdf)*
NE	*LM—CT158 (https://www.ams.usda.gov/mnreports/ams_2485.pdf)*
CO	*LM—CT134 (https://www.ams.usda.gov/mnreports/ams_2670.pdf)*
IA–MN	*LM—CT137 (https://www.ams.usda.gov/mnreports/ams_2672.pdf)*

Addendum 4—Q2 Negotiated Trade Volumes by 5-Area Region Compared to NCBA's 75% Thresholds and 100% of "Robust" Price Discovery

NCBA Fed Cattle Negotiated Trade Tracker—2021 Q2

Region	75% Threshold	Category	Week Ending: 4/11/2021	4/18/2021	4/25/2021	5/2/2021	5/9/2021	5/16/2021	5/23/2021	5/30/2021	6/6/2021	6/13/2021	6/20/2021	6/27/2021	7/4/2021
TX–OK–NM	9,750	*Neg. Cash*	13,387	8,900	3,668	9,055	6,850	7,953	7,071	9,183	5,776	7,470	7,440	1,324	5,355
		Neg. Grid Base	4,750	5,643	5,561	7,764	4,998	5,778	6,190	7,936	8,771	7,573	6,990	7,534	5,029
		Total Neg.	18,137	14,543	9,229	16,819	11,848	13,731	13,261	17,119	14,547	15,043	14,430	8,858	10,384
KS	15,750	*Neg. Cash*	21,343	14,758	6,345	8,374	7,881	8,814	16,536	13,843	9,326	13,602	22,727	2,921	13,291
		Neg. Grid Base	5,395	4,984	4,127	8,206	8,350	10,318	7,496	11,021	10,864	9,624	7,499	7,115	12,075
		Total Neg.	26,738	19,742	10,472	16,580	16,231	19,132	24,032	24,864	20,190	23,226	30,226	10,036	25,366
NE		*Neg. Cash*	31,150	25,593	21,314	22,886	32,744	23,087	25,735	28,551	17,189	35,353	20,781	18,700	25,960
		Neg. Grid Base	6,841	4,338	2,945	5,762	3,371	2,563	10,683	13,562	13,248	16,922	10,141	8,437	7,410
	27,000	*Subtotal Neg.*	37,991	29,931	24,259	28,648	36,115	25,650	36,418	42,113	30,437	52,275	30,922	27,137	33,370
CO *		Neg. Cash	4,322	2,850	1,708	25,261	995	1,135	857	1,299	—	—	—	—	—
		Neg. Grid Base	2,451	2,061	553	2,545	265	210	1,664	2,263	—	—	—	—	—
		Subtotal Neg.	6,773	4,911	2,261	27,806	1,260	1,345	2,521	3,562	—	—	—	—	—
		Total Neg.	44,764	34,842	26,520	56,454	37,375	26,995	38,939	45,675	30,437	52,275	30,922	27,137	33,370
IA–MN	12,000	*Neg. Cash*	26,573	27,552	24,529	15,590	26,387	18,389	19,093	21,447	22,738	27,427	16,652	16,347	30,317
		Neg. Grid Base	3,053	3,903	2,308	2,998	3,269	4,516	4,413	7,047	4,484	5,195	4,975	3,414	6,035
		Total Neg.	29,626	31,455	26,837	18,588	29,656	22,905	23,506	28,494	27,222	32,622	21,627	19,761	36,352
75% Thresholds															
TX–OK–NM	9,750	*Pass/Fail*	8,387	4,793	(521)	7,069	2,098	3,981	3,511	7,369	4,797	5,293	4,680	(892)	634
KS	15,750	*Pass/Fail*	10,988	3,992	(5,278)	830	481	3,382	8,282	9,114	4,440	7,476	14,476	(5,714)	9,616
NE–CO	27,000	*Pass/Fail*	17,764	7,842	(480)	29,454	10,375	(5)	11,939	18,675	3,437	25,275	3,922	137	6,370
IA–MN	12,000	*Pass/Fail*	17,626	19,455	14,837	6,588	17,656	10,905	11,506	16,494	15,222	20,622	9,627	7,761	24,352
100% Robust (FYI Only)															
TX–OK–NM	13,000	*Over/Under*	5,137	1,543	(3,771)	3,819	(1,152)	731	261	4,119	1,547	2,043	1,430	(4,142)	(2,616)
KS	21,000	*Over/Under*	5,738	(1,258)	(10,528)	(4,420)	(4,769)	(1,868)	3,032	3,864	(810)	2,226	9,226	(10,964)	4,366
NE–CO	36,000	*Over/Under*	8,764	(1,158)	(9,480)	20,454	1,375	(9,005)	2,939	9,675	(5,563)	16,275	(5,078)	(8,863)	(2,630)
IA–MN	11,000	*Over/Under*	18,626	20,455	15,837	7,588	18,656	11,905	12,506	17,494	16,222	21,622	10,627	8,761	25,352

**Zeroed cells denote unavailability of data due to confidentiality.*

Sources:

Addendum 4—Q2 Negotiated Trade Volumes by 5-Area Region Compared to NCBA's 75% Thresholds and 100% of "Robust" Price Discovery—Continued

NCBA Fed Cattle Negotiated Trade Tracker—2021 Q2

Region	75% Threshold	Category	Week Ending:												
			4/11/2021	4/18/2021	4/25/2021	5/2/2021	5/9/2021	5/16/2021	5/23/2021	5/30/2021	6/6/2021	6/13/2021	6/20/2021	6/27/2021	7/4/2021
Region:	USDA–AMS Report:														
TX–OK–NM	*LM—CT156 (https://www.ams.usda.gov/mnreports/ams_2483.pdf)*														
KS	*LM—CT157 (https://www.ams.usda.gov/mnreports/ams_2484.pdf)*														
NE	*LM—CT158 (https://www.ams.usda.gov/mnreports/ams_2485.pdf)*														
CO	*LM—CT134 (https://www.ams.usda.gov/mnreports/ams_2670.pdf)*														
IA–MN	*LM—CT137 (https://www.ams.usda.gov/mnreports/ams_2672.pdf)*														

SUBMITTED LETTER BY HON. DON BACON, A REPRESENTATIVE IN CONGRESS FROM NEBRASKA; ON BEHALF OF WILLIAM H. RHEA III, PRESIDENT, NEBRASKA CATTLEMEN

July 28, 2021

Hon. JIM COSTA,
Chairman,
House Subcommittee on Livestock and Foreign Agriculture,
Washington, D.C.

Hon. DUSTY JOHNSON,
Ranking Minority Member,
House Subcommittee on Livestock and Foreign Agriculture,
Washington, D.C.

RE: State of the Beef Supply Chain: Shocks, Recovery, and Rebuilding

Dear Chairman Costa, Ranking Member Johnson, and Members of the Committee:

Nebraska Cattlemen is grateful for the opportunity to share our member's concerns regarding the live cattle market, processing capacity, and market transparency. Our organization is a grassroots membership organization representing thousands of farmers and ranchers from every scope and sector of the beef cattle industry in Nebraska.

Live Cattle Market: It is our cattle producer members and their livelihoods that are directly impacted by the cattle market's ability or inability to send appropriate price signals up and down the beef cattle supply chain. In the past decade, those price signals have encouraged ranchers to expand their cow herds and cattle feeders to expand their feeding operations as domestic and global demand has exponentially grown like few could have imagined. Yet today as wholesale beef prices start to shift from historic highs, the percent of the available beef supply chain profit margins being passed onto cattle producers is near historic lows.

It has become painfully apparent to our members that, in recent years, the ability of the cattle market to send the correct price signals to producers has been broken. For the greater part of a decade, this has been a headline issue for members of our organization.

Where we are today is not a result of a malicious plot to purposely stifle ranchers' livelihoods, but rather has been a progression—across the beef supply chain over the last 2 decades to become increasingly more efficient in fed cattle marketing and inventory management as an industry through the use of alternative marketing agreements (AMAs). While these efficiencies have benefited some, they came at the cost of robust price discovery and market leverage for other producers. Undoubtedly, you will hear today about the positive industry effects of AMAs, otherwise defined by USDA Livestock Mandatory Reporting as "formula" trades, which have helped incentivize the production of higher quality beef. Please realize, however, that the long-term proliferation of AMA's has also led to a continued deterioration of price discovery as beef packers have financially incentivized commitment of cattle without price negotiation.

Price discovery is a public good. Negotiated cash market participants invest resources to negotiate and discover cash market prices for the entire industry, while those who utilize AMAs capitalize on that investment, benefit from the efficiencies, and make use of the prices discovered by cash market participants. This type of scenario is best described as a tragedy of the commons. When an increasing number of market participants overuse a public good or "shared resource" for their own short-term best interest, abuse of the shared resource results in less value of that resource overall for everyone in the long run. Until the price discovery "public good" is better valued by both beef packers and some cattle feeders, the industry will continue on this downward spiral until there is little to no negotiated trade left and other outside markets will have to be relied on for price determination.

How does our industry correct this course? Continuing to focus on expanding options for market participants to participate in price discovery is key. Our members seek options that contribute to price discovery like working with the packing industry to sell on a negotiated grid—a mechanism that allows producers to garner premiums for higher value cattle while still participating in the price discovery process by offering their cattle to numerous buyers. However, producers have grown frustrated with the lack of willingness of all packers to offer this marketing option. In order to incentivize packers to participate in the negotiated market and contribute to price discovery the industry must either mandate participation, financially incentivize negotiated trade or penalize entities who continually show a lack of participation in the price discovery process.

An additional source of frustration for our members is the continued perception that all AMAs reward carcass merit and therefore are the sole reason the industry has seen an increase of quality grade. Earlier this month, Nebraska Cattlemen worked with USDA–AMS to gain additional insight into the mix of transaction types that comprise the "formula" fed cattle price and volume data that is reported by USDA–LMR. Specifically, NC sought more information regarding the total volume and/or percentage of total reported "formula" headcounts that are transacted in such a way that USDA quality and/or yield grade parameters have a bearing on the final price paid vs. the volume and/or percentage of total reported volume where that is NOT the case.

Analysis of USDA–LMR data from January through mid-May of 2021 indicated rather clearly that in the Nebraska and Iowa/Southern Minnesota LMR regions (compared to other regions), there is a higher percentage of cattle that fall into the "formula" transaction type that are simply marked at the LMR weekly Nebraska dressed steer weighted average price, or possibly that data point plus some predetermined premium, but there are no other premiums or discounts applied relative to quality grade or yield grade. We understand why this type of transaction falls into the "formula" data as it is not a negotiated cash sale, a negotiated grid sale, or a contract purchase—however we also see it to be somewhat different than a transaction that involves quality and or yield grade premiums and discounts. Our specific ask was to look at the prevalence of this type of transaction type in the LMR "formula" data set on a regional, 5-Area, and nationwide scale.

The results showed that the northern regions, specifically Nebraska and Iowa/Minnesota, exhibited the highest proportion of transactions with no premium or discount applied. With the quality of the cattle/beef not having any direct impact on the net price paid for cattle marketing in this manner it would appear that any premium being paid by the buyer is essentially being done to reward suppliers for furnishing unpriced inventory and consequently reducing the buyers need to participate/compete in the negotiated market and contribute to the price discovery process.

Processing Capacity: Just as cattle producers respond to market signals to expand their cow herds and feeding operations to meet domestic and global demand, we question why the beef packing industry has not responded to those same signals for the past 5 years?

Adequate beef processing capacity is critical to maintaining profitability in the beef and cattle industry, and ensuring a steady supply of beef and beef products to consumers. Currently, there is not only a shortage of adequate processing capacity, there is also a reduction of processing throughput across the country. A recent study by Rabobank found that excess operational beef processing capacity fell to zero in late 2016 and turned negative in early 2017, resulting in a negative effect on cattle producer leverage in fed cattle negotiations because of lack of competition.

To improve producer leverage in fed cattle negotiations, either cattle supplies must be reduced, or processing capacity must be expanded. With domestic and foreign beef demand at an all-time high, the obvious solution to meet this growing demand without shrinking the U.S. beef herd is to expand beef processing capacity. We understand expanding capacity with new construction comes with a certain level of risk and takes time, but we do believe there are opportunities with current facilities to help meet the growing demand for beef in the near-term. Beef packing plants, transporters and our member farms and ranches are all currently experiencing challenges with labor recruitment and retention. Congressional action to reform immigration policy to advance needed H–2A visa restructuring and ensuring state and Federal resources are available for immigrants to be offered employment opportunities and to successfully thrive in our communities is critical to helping current packing plant infrastructure reach full 100% throughput.

Market Transparency: Another key component to price discovery and price determination is market transparency. Senator Deb Fischer, in both the 116th and 117th Congress, introduced the Cattle Market Transparency Act to address many of our members' concerns in regards to market transparency. Similar efforts in the House of Representatives, led by Congresswomen Vicky Hartzler of Missouri, mirror the call for increasing price discovery and expanding market transparency as well as the adoption of a beef contract library, 14 day slaughter reporting window, and ensuring that USDA finds a way to report collected information in a manner that ensures confidentiality but prevents USDA–AMS from withholding from the public information collected in LMR.

Thank you for the opportunity to share the thoughts and concerns of Nebraska Cattlemen members. As we continue to work towards finding solutions to keep

cattlemen and women in business, we look forward to being at the table to talk through these solutions and take actions to protect our members' family legacies.

Best,

WILLIAM H. RHEA III,
President,
Nebraska Cattlemen.

SUBMITTED QUESTION

Question Submitted by Hon. Dusty Johnson, a Representative in Congress from South Dakota

Response from Jennifer van de Ligt, Ph.D., Associate Professor Veterinary Population Medicine, College of Veterinary Medicine; Director, Integrated Food Systems Leadership Program; Director, Graduate Studies Applied Sciences Leadership; Director, Food Protection and Defense Institute, University of Minnesota, St. Paul, MN

Question. The COVID–19 pandemic has shown us firsthand the interconnection between people, animals, their shared environment, and the devastation that global diseases can bring to food supply chains everywhere. In fact, more than ⅔ of the emerging human infectious diseases are zoonotic—meaning that they are passed from animals to people. That is why my colleague, Congressman Schrader, and I have introduced legislation that would require interagency coordination to respond to zoonotic diseases through a One Health Program. Dr. van de Ligt, can you share with us your work in the space of animal health and protection?

Answer. September 24, 2021

Honorable Dusty Johnson, thank you for your inquiry "The COVID–19 pandemic has shown us firsthand the interconnection between people, animals, their shared environment, and the devastation that global diseases can bring to food supply chains everywhere. In fact, more than ⅔ of the emerging human infectious diseases are zoonotic—meaning that they are passed from animals to people. That is why my colleague, Congressman Schrader, and I have introduced legislation that would require interagency coordination to respond to zoonotic diseases through a One Health Program. Dr. van de Ligt, can you share with us your work in the space of animal health and protection?"

I am the Director of the Food Protection and Defense Institute and Associate Professor in the College of Veterinary Medicine at the University of Minnesota.

The Food Protection and Defense Institute (FPDI) at the University of Minnesota is an Emeritus Homeland Security Center of Excellence dedicated to providing leading-edge research, technical innovation, and education to protect the food system from disruption. Since 2004, FPDI has partnered with stakeholders across government, industry, NGOs, and academia to assure product integrity, supply chain resilience, and brand protection throughout the food and agriculture sector.

In reviewing the proposed legislation you referenced, we submit that the focus on zoonotic diseases in the proposed legislation, under the auspice of One Health, is too narrow a definition, albeit an important component of One Health. According to the Center for Disease Control and Prevention (CDC), "One Health is a collaborative, multisectoral, and transdisciplinary approach—working at the local, regional, national, and global levels—with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment." The CDC definition continues "One Health issues include zoonotic diseases, antimicrobial resistance, food safety and food security, vector-borne diseases, environmental contamination, and other health threats shared by people, animals, and the environment. Even the fields of chronic disease, mental health, injury, occupational health, and noncommunicable diseases can benefit from a One Health approach involving collaboration across disciplines and sectors."

Our work in the space of animal, human, and environmental health, protection, and sustainability, under the auspice of One Health, is focused with a lens of food and feed security and safety for the health of humans and animals including environmental impact. Examples of specific research and outreach include:

- Establishing a cross-functional research and response team related to African Swine Fever. This team has developed a *R*isk-free ***I****n-****s****itu N*on-pathogenic *A*ssay (RISNA) to speed development of protection, decontamination, and mitigation strategies to prevent transmission of African Swine Fever through the food and

feed supply chain. Although African Swine Fever is not a human health pathogen, introduction of ASF into the U.S. would devastate the pork industry and lead to additional food insecurity and nutritional inadequacy concerns within the U.S., and internationally.

- Leading the premiere food defense training program within the United States to protect the food and feed supply chains from the risk of intentional adulteration. Intentional adulteration has the potential to cause wide-scale harm to human and animal health. In this role, we offer workforce development training programs that provide essential skills-based training to enable food company compliance with the Food Safety Modernization Act "Mitigation Strategies to Protect Food Against Intentional Adulteration." We also collaborated with the Food and Drug Administration and Food Safety and Preventive Controls Alliance to transition key aspects of this training to enable instructor-led virtual (online) delivery. The online delivery began in response to COVID pandemic conditions, but will be retained as a successful training model into the future.
- Informing food and feed supply chain emergency response. We produced a *43-issue series of "COVID–19 Near-Term Issues Spotting in Food Supply Chain"*[1] updates from April 17, 2020 to August 21, 2020 that informed our stakeholders about imminent COVID–19 issues threatening the food supply chain and national health security. The focus of the updates was related to the disruption in the beef, pork, and poultry supply chains that were driven by closures of meat processing facilities for worker health reasons. Broader food access and food security concerns were also highlighted. Stakeholders found the situation updates informative and the distribution list grew organically to include over 150 Federal, state, and local representatives across government, industry, and academia. The updates were influential within the national emergency response surrounding the meat processing plant closures including briefing and subsequent action by the White House due to the issues spotting function and inclusion of actionable opportunities available to emergency response teams.
- Educating public and private stakeholders on the importance of cyber hygiene and protection in the food and agriculture infrastructure. Our research highlighted several key areas of cyber hygiene and defense that are unique, and often overlooked, in the food and agriculture space. For example, many aspects of the food and agriculture infrastructure require operational technologies to perform the most critical functions of production needed to assure food safety (*e.g.,* pasteurization, rapid chilling, pressurization, *etc.*) and/or protect worker health. Unfortunately, most of these operational technology systems do have appropriate cyber protections in place to protect them from disruption. As a result, the ransomware attacks on JBS and the grain cooperatives, New Cooperative and Crystal Valley Cooperative, resulted in shutdown of essential functions adversely affecting the food supply chain and consumer prices.
- Informing broader University of Minnesota research teams focusing on zoonotic diseases, anti-microbial resistance, vector-borne diseases, environmental contamination, chronic disease, occupational health, and noncommunicable disease about the implications and applications of their research within the food and feed supply chains and facilitating connections for further exploration.

These research and outreach areas are not the only ways in which we work to protect the food and agriculture critical infrastructure through a One Health approach. As you mentioned in your question, interagency collaboration and coordination will be an essential part of our success to assuring One Health across human, animal, and environmental health. We also believe this coordination should extend broadly across the sector including both public and private stakeholders. Our engagement in this area and these discussions help assure that meaningful and productive dialogue continues at all levels of food and feed production, human and animal health, and environmental sustainability from farm to fork. We look forward to continued dialogue and any further questions you may have.

Respectfully,

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[1] *https://hdl.handle.net/11299/219252*.
Editor's note: the 43 issue series is retained in Committee file.

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