

# Episode 1: Coronavirus

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- [Narrator] This podcast is for educational purposes only. The views expressed by both guest and host are their own and their appearance on this program does not imply endorsement by the University of Delaware or UD Cooperative Extension.

- Welcome to Extension 302. We are the Partners in Crime. My name is Blake Moore. I am the natural resources and horticulture agent based out of Kent County.

- Hey I am Dan Severson. I am located in Newark, Delaware. I am New Castle County Ag Agent. I have statewide responsibilities for dairy and small ruminant.

- So I'm Jake Jones, the Kent County Ag Agent at the University of Delaware at the Paradee Center. I have responsibilities within Kent County, they keep me locked in there.

- And I'm Katie Young, Digital Media Specialist with UD Cooperative Extension based in Kent County, Delaware. We have three fantastic guests here to answer your questions. So let's dive right in.

- It is my pleasure to welcome Dr. Calvin Keeler from the University of Delaware Department of Animal Food Science. He is a professor of molecular virology. I met Dr. Keeler back in 1990. Thank God he doesn't remember any of that. We became colleagues in 2002, when I started working for the University of Delaware. We continue through today. He has a vast dynamic background in virology and actually Dr. Keeler I didn't know that you actually did a stint at Dupont and Neours and Company in Wilmington. So the focus of this podcast today is to talk about viruses and specifically COVID-19. So for our listeners out there. What exactly is a virus?

- Okay thanks Dan for the introduction. So a virus, it's a very small particle and you can see a fungus. You know it makes us spore, a mycelia. You can see bacteria under a light microscope or even just pond water you can see the amoeba and things like that. But viruses are really really small. You need an electron microscope in order to see them. And they are, essentially they're intracellular, little intracellular parasites. They don't move. They don't grow. But what they do is they attach to and enter other cells and they hijacked them, they hijack them. And they take over a cell's normal functions of making energy and making proteins and they take them over for their own purpose. And so viruses don't end up dividing like bacteria, they end up by replicating. They're like LEGOS. So you get a cell that's full of Lego parts and then they assembled inside a cell into lots of new virus particles and then those virus particles are released into the environment to infect other cells. So they're not cells. They're not classically defined as being living, but they are these little molecular sorta machines that take over eukaryotic cells. And there are viruses that infect bacteria. Viruses

that infect plants. Viruses that infect animals, animal viruses. And coronaviruses like COVID-19 is an example of one of these animal viruses. Cool.

- Spinning off of that. What is a coronavirus? And specifically what is COVID-19?

- So a coronavirus, viruses are tough to characterize. Because they come in all different shapes, all different sizes, all different structures. The only constant is that they're all tiny. And a coronavirus gets its name because if you look at it at the atomic level, with an electron microscope it's like a sphere, a little sphere or ball and that ball is studded with these little spikes. And so if you look at a picture of it. And there are pictures from the CDC and everything, it looks like a crown. It's looks like the spikes on a crown. That's how it got the word corona-virus. And this virus, our cells, human cells, your dog's cell are all the genetic material is DNA or deoxyribonucleic acid. Coronaviruses are a class of organism of virus where the genetic material is RNA, ribonucleic acid. So it's a different type of genetic material than we have in our cells. And that spike protein, those crowns, on the spikes on this virus, those spikes are proteins. And they are called spike proteins. The muted S. And they're really important for the biology of these viruses. Now I mentioned how viruses have to attach and they enter into cells in order to take them over. And this protein, these crowns on this virus are the proteins that do that attachment. And but the same time, since they're on the surface of the virus, when this virus is in an animal like a human, these are the proteins that humans and other animals recognize and then mount an immunity response to. So they're important in the host recognizing and trying to mount a defense against these viruses. So that's that major structural protein on the surface that makes a distinctive structure and also really important for its biology.

- Dr. Keeler coronavirus, this is a novel coronavirus right? Can you tell us how it emerged and how it evolved? And was to spread all over the world like this?

- Yeah, that's a really good question. So there are lots of coronaviruses. There are many, probably hundreds of different coronaviruses around. And actually most, a third of the colds that people get in the winter time are actually caused by coronaviruses. But not obviously not this virus or its relatives. So they're coronaviruses is all over the place. There are coronaviruses that infect animals as well. So infectious bronchitis virus is a very common coronavirus that infects chickens. This virus apparently originated in bats, and then it was somehow had been able to transmitted to an animal intermediate. Perhaps a Pangolin, which is kind of like a armadillo-type looking creature. And then from there it went into humans, it specifically went into a fish market we believe and a live animal market in Wuhan, China. And that's where we're it first started. And as you think about, what I just described. So it started in a animal and then went to second animal and then went to a huamn. That was the first human this virus has ever been in. And so that's what really causes the problem. So we have a person who's now infected with the virus and this is a new virus. Never been in humans before and so you know we all, everybody gets vaccinated for chickenpox and so that virus is around. People are protected against chickenpox. People get vaccinated every year for the influenza virus. Even though influenza causes a big a lot of disease. You know there's a lot of people that are vaccinated. A lot people that have been infected with the influenza virus before and so they, now immune to that virus. But now here's a person in Wuhan, China who's gotten this brand new virus that nobody's ever seen before. And so when that virus, as I described, replicates in his cells and then gets released and then he coughs it out or contaminates a piece of machinery and another person gets exposed to it. That person has never seen that virus before either. And so now you have

a spread of this virus in a localized population in China. Nobody's ever seen this. Everybody is amenable to being affected by this virus. Humans have never been exposed to it. There's no natural immunity. There's no pool of people who have been immunized that are protected. Everybody's susceptible. And then so it gets in one city in China and then because we are such a mobile society now, as people move and visit friends and relatives or air travel go to different countries, then that virus spreads to other countries that have never seen this virus before. And so that really the issue. We have a new essentially organism that's now sort spreading across the world and people that are completely susceptible are now being exposed to it. And that's sort of how this virus has emerged and how it's spread across the global population. So it's not the fact there's an RNA virus or a DNA virus, that's really kind of irrelevant. The fact is that humanity was naive to this virus. People, humans had never been exposed to this pathogen, to this agent before. And so nobody was immune to it. Nobody had ever been exposed to it. And so everybody currently that gets exposed to it gets infected by it and the virus infects people in different ways and that's why you get different levels of susceptibility and different disease and then each person then becomes a potentially, that's infected because potentially a little living incubator that can then spread the virus to other naive people. So that's what makes it such a threat. That there's no, it's never been seen before this particular virus. It's evolved separately. So can give it whatever name you want. You can give it, it could be a different type of genetic material, but this virus is unique to this place in time in our history. And humanity now has to essentially respond to that biologically, and we try and help it along. Perhaps by developing vaccines or treatments. But the world's going to now be exposed to this virus and is going to respond to it and so that eventually, maybe this virus goes away like other viruses. maybe it stays around. But it stays around the population in the world now in the future will have seen this virus. And so people will be immune. They'll be treatments for it. And so it won't be as bad in the future. And that's what we talked about this spike of infectivity. And people have seen it going around the world, you know first in China and then Italy and then in Spain and now in the United States. And so this virus is now being progressing at different parts of the world and the new naive populations of animals, humans in this case are being exposed to it and responding to it.

- Thank you.

- So can you give us examples of other diseases, other coronaviruses that are related to COVID-19?

- I can, yeah I can a little bit. So as we were talking about this is an example of a zoonotic virus. So that's a virus that started out in animals and then ended up in humans. And so it's a virus that has jumped the species barrier. So it can go from animals to humans. So ebola is another example of a virus that, it's not a coronavirus, but it's an example of another virus that essentially started in bats and then goes into monkeys and other primates and then can then go into humans. So that's another example of a zoonotic disease. But there are lots of viruses that aren't zoonotic. So you don't think that all viruses, all animal viruses do that. So there are lots of viruses that aren't zoonotic. For instance we talked about mentioned infectious bronchitis virus before, which is a coronavirus that infects chickens. That's not a zoonotic virus. That virus doesn't infect humans. Right, it's been around in chickens for a long long time. But the COVID-19, it's closest relative are two viruses that are also zoonotic. The first one was the SARS virus. The Severe Acute Respiratory Syndrome. That's actually also started in Southeast Asia, in China. And that's also a coronavirus the same class of virus family, this beta coronavirus. And it was started out, came from also from bats and then it apparently went into civet cats and then from there went from cats into humans. And so

that's one example. And then there's another virus that people may have heard of is MERS, Middle Eastern Respiratory Syndrome, which is another coronavirus same sort of family as the COVID-19 virus, initially started out in bats and that virus then went to camels. And then from camels infected humans. So zoonotic viruses are interesting to sometimes follow what how they evolve, and go through different chemical phases. We're still not exactly sure what where COVID-19 came from, but it did come from a live animal market. And so the assumption is one of those animals from that market was the carrier that infected that first worker.

- What has to happen with the virus to make that jump? How does it evolve in order to do that?

- That's a really good question and there are a lot of groups around the world, that are essentially, they've sequenced now hundreds if not thousands of different islets of this virus and to try and track back and see where it developed and so that's how we know it came initially from bats. Because if you sequence all the nucleotides that are in this virus' genome. It's most closely related to a coronavirus that already been found in bats. And so probably what happened in this case, people haven't done the biology yet to confirm it, is that in while it's replicating and while it's growing and while it's assembling new virus particles, mistakes happen, in while its genome is being replicated and so it gets these random mutations occasionally. And so at some point there was as set of mutations that changed the structure of this virus so that now I can not only infect this animal's cells, but it could actually attached to and infect human cells. So we don't know exactly what those changes are. But they were changes at the genetic level that somehow change the confirmation probably of this spike, this S-protein that allowed it to infect a different range of cell types and then what happened to be in humans. And it's a continuing process, as this virus evolves and goes around the world, people can have followed mutations that are happening in this virus as it progresses through time.

- So how can this virus be monitored and controlled? And we talked about a vaccine and then the immunity coming to the population, but are those our only two options and they both are going to take a quite a bit of time, correct?

- That's correct. So monitoring, so what has been done so far, the people have been monitoring is actually the presence of the virus' genetic material. And so that's what these tests are involved where people take swabs. You take a swab from a cheek or a nasal swab from an individual and you isolate all the nucleic acid that's in there. And then test it to see oh, is there any genetic material from COVID-19 in the swab? And that's that could be a fairly rapid test. One of the bottlenecks is not just the test itself, but also the equipment and the reagents in order to conduct the test. So there are a couple levels of needs for laboratories in order to conduct these tests. And that's a good test but it that only gives you part of the story. It tells you whether a person has the virus in them in that particular time, but if you think if you got a cold or something like that and you tested yourself during this test, a month or so later, you wouldn't detect the virus anymore. And so we don't know, you don't know during this test whether somebody was infected a month ago, but they've already been cured and the viruses is gone. All you're looking for is the material from the virus. So there's another test, they're antibody-based tests or antigen-based tests that are gonna need to be developed. And they're starting to be developed, but they take a little longer to develop. To look and see okay, not only is a person actively infected with this virus. And so we can determine who's infected but later on you can go back and say, okay looking back at the population how many people

were exposed to this virus? 'Cause if you were exposed to this virus and you mounted an immune response, a lot of the times a immune response to pathogens and diseases is antibodies. And they last a long time, unlike the virus. So antibodies can last in the body for a long period of time. So you can retroactively look at a person, and say oh did this person mount an immune response to this virus? And if that person did, say ah, that person at one point in the past was exposed to this virus. And another thing you can do is have quicker test than these, genetic test that will actually look for viral proteins. So there, this first generation test, these tests for genetic materials are really good but there are further developments of different types of tests that will give us different types of information that'll be beneficial in truly determining who's been exposed and when they when they had been exposed. And that's one of the reasons why you look at epidemiologist and scientists. And they say, well, if you look at the mortality of this virus being a couple of percent. Saying eventually we have this information we'll find that mortality is much less than that. Because we'll find a lot of people that were exposed to the virus but perhaps didn't show any symptoms or very mild symptoms and so they were never tested for the virus itself. But we can find out later they had been exposed. And you know it's important to realize that they're still saying over 80% of the people exposed to this virus either have no symptoms or very mild symptoms. And that the symptoms of this disease are really different from the flu. I mean there's no real sore throat or runny nose or congestion. If you have those symptoms, you're really having a cold or some other respiratory disease. Is this fever and this dry cough and this muscle pains that are the primary symptoms of this disease. So that's the monitoring aspects. You know we can detect the genome of the virus, the genetic material and we're coming up with tests to say, okay, now we can detect for the virus. Now let's check and see how the human is responding to the virus and the vaccines and treatments is another the whole area of really really active study and a lot of efforts are underway. There are clinical trials already going on for three or four different therapeutics and vaccines that I know of and probably more than that. And vaccines there are many ways to approach it, right? So there are some vaccines that help the immune system, right? So a vaccine might be protein from this virus that you can give to a person so that it's just one person so the person doesn't get sick. But it can mount an immune response to that protein. And then when it that person gets exposed to the virus, it's got already the immunological memory there that it can fight off the infection. There are treatments that go after proteins that are made by this virus. So this virus has a complex process, you might imagine it's a complex way it's assembled and created. And so you can throw a monkey wrench into that process and mess up the process for how it makes new viruses. So that's another way to help develop a vaccine or a treatment And then there are also other treatments that work to help enhance the immune response. They're not like directly against the virus itself. But they're to aid the human immune system in responding to the virus. Or they're actually help involved in damping down the bad reactions from the immune system a lot of the the very critical patients we see with COVID-19 are peoples whose immune responses and I here we're talking about their innate immune responses. These rapid things you get a blister, you get reddening and swelling and fever. That's all part of the immune response and some people because of their previous medical conditions, overreact. And so that response is too robust and so some treatments are trying to two lesson that response so that the immune response isn't too strong against the virus. So there's lots of different approaches that people and researchers and physicians and scientists are approaching. They've all shown success different models in different diseases. And so it's a matter of approaching this in many different areas different prongs. Some of which will be complimentary. Some of which be used in tandem with each other to eventually control this. I'm sure that some point this will be in the near future we'll have good treatments and vaccines against this disease.

- My question is what's the deal with bats?

- What's the deal with bats. That's a good question because bats seem to be the ultimately source of a lot of things. And so I had somebody say to me, so why don't we just get rid of all the bats? And I said we'll you don't want to get rid of all the bats. Bats play a really important role in the ecology of nature. In controlling insects and in pollination. And so you can't do that. Bats have a really interesting life cycle where they hibernate they've developed a very unique. Their immune system is different than humans or dogs or anything like that. And so they've developed an immune system that appears to let some viruses, how should I say this? Essentially let's them replicate in their cells, but not actively end up destroying those cells. And so they end up being a reservoir for many different types of viruses. And it's how the viruses interact with the immune systems of bats.

- I've been thinking a lot of bat implications. But a lot of people saying that it came from someone eating a bat. And so I think that it was very useful to see that it's more complicated than that. And a lot of the stuff isn't necessarily true.

- It's like a little knowledge is a dangerous thing. And so it's really tough. And we all are so desperate to get knowledge that you know everybody takes this little piece of information you get from here or there. And everybody's just trying to make the best sense of it they can. And so it makes it tough.

- Do you have any advice or misinformation that's out there that I listen to you talk on the town hall meetings. And sales of Corona beer have dropped and this and that. How can we curb that kind of mentality?

- You know I think the way to curb it is essentially to try and self filter the news you get. And what you're listening to, because it really comes down to I think my advice is it really ends up being practicing good bio security. And you know people the agriculture industry know what biosecurity is. Right and the poultry industry and keeping your houses, poultry houses clean and watching who comes in. Making sure they wear gloves and clothing and boots. And it's the same principles only instead of you're a farm animal you need to practice it on yourself. Don't make it too complicated, wash your hands, disinfection, surfaces and social distancing are what's going to make this situation less bad than it could be. Many many people are going to be infected. Many people are gonna get sick. I agree with the experts I've read that we're still on an increase here, more people are gonna get sick. There's gonna be more disease, it's gonna get worse and then it gets better. But you know take care of yourself and follow the Governor's directives regard to travel and social gatherings and hunker down and this will pass.

- Thank you sir.

- My please Dan, Jake, Blake and good luck, stay safe and we'll be in touch.

- Dr. Gordon Johnson extension fruit vegetable specialist at the University of Delaware, Carvel Research and Education Center in Georgetown, Delaware. Dr. Johnson is an assistant professor in the Department of Plant and Soil Sciences at UD. And is the Produce Safety Alliance Lead Trainer, which makes him responsible for educating and preparing growers for the Food Safety Modernization Act Produce Safety Rule. Thanks for talking with us Gordon. So the first question we have is can coronavirus be spread through the food system?

- Well that's an interesting question, the current science and FDA guidelines state that the virus is not transmitted via food. So people should not be trying to avoid fresh fruit, produce for example. Because it is a respiratory virus and you would have to pick the virus up, if it had any virus on it, the food or the packaging and then touch your nose or mouth, like your mouth or nose and that's a very low probability that number one there would be virus on the food and number two that you would actually transmit it to infect yourself.

- Okay if you eat the virus would you get infected or it has to be to the respiratory?

- Yeah, it's not like our foodborne virus illness, viruses like you would have a Norovirus for example where it is a gastro virus. This one is a respiratory. It enters most common it enters through the nose.

- Okay.

- So Dr. Johnson, we should still wash our fruit and vegetables just to make sure, even if it's not COVID-19, but just to, we should always wash our fruit and vegetables.

- Yes, it's a good practice for food safety, remove any dust residue waxes whatever that has been put on the produce for display. And it's a good food safety practice. Because we're mostly concerned with bacteria that cause food borne illness such as salmonella, E. coli and the best way to protect against that getting any foodborne illness in a fresh fruit or vegetable that you going to eat raw is to wash it with cold tap water. If you have a soft brush you use that. The produce, no need to use soaps or any of those special produce washes. Just rinsing it with cold water and soft brush.

- Thank you as we know any kind of production of fresh produce is very labor-intensive. So are you hearing about there being any issues with H-2A workers and the availability of them?

- Yeah, I've talked to one of our largest growers. Currently what is the government position is that H-2A workers had worked in the U.S. previously they would be allowed back in what is the issue is any new workers that have to go through an interview process and that's still being worked out. The thought is we might be down about 20%-30% on our labor force for the year. That however is a little bit up in the air. My recent reading is that they're still having some issues getting into the country. But hopefully by the time our produce is being harvested, that'll be solved.

- Thank you.

- Does the Food Safety Modernization Act have any rules to prevent outbreaks of contagious diseases like that or is it mainly just those foodborne illnesses?

- It's to protect against foodborne illnesses as well as worker safety of the employees in the food system. So I just read some guidance from the FDA for those, for folks in the food industry and the main concern is if they're to keep employees, any employees with symptoms, as with any business is to send them home and then determine whether or not there's been any other infections in the workforce. That's more from a workforce safety standpoint, not from a product safety standpoint. They said there was no need to, other than normal disinfecting procedures, no need to do any disinfecting of the products themselves. Any additional above what they were currently doing. Now the facilities themselves, so that you don't have employee transmission to employee transmission. They should be sanitized as per FDA guidelines, CDC guidelines.

- Okay, thank you.

- So we're getting to the point now, it's planting season. And we're gonna have a lot of people planting for their fresh markets, farmers markets, you picks and stuff like that. How should these producers prepare for this, especially you know if you're going to farmers markets or you have people coming to your farm?

- Well there's actually two questions there. I'll address the planting part. What all farmers across the U.S. are being encouraged to do is to continue with what that would be their normal practice, this is particularly fruit and vegetable growers to assume that you're going to be same demand and to plan accordingly. They're going to be some issues with direct markets to try to distance so how that they can do that has to be thought through. The main thing is particularly when you're selling inside a facility is that keeping people within that six-foot distance. Current science shows that it's mostly droplet transmitted. Science is still unsettled whether or not there's any aerial transmission but to the best majority of cases as far as the World Health Organization. I heard an interview from them yesterday is droplet transmit. So that six-foot, two-meter guideline. And how to do that in a direct marketing standpoint, needs to be worked out by each grower. So that would be the main issue. Surfaces are important but not nearly as important as the distance between and how you handle the produce. Getting the produce to the consumer.

- So it's normal work for farmers right now. They got to continue to keep goin'?

- Yeah, that's what I'm doing, I'm a small-scale producer myself. And I'm assuming that I'm not going to have a disturbed sale season. Within the industry itself, there's some shifts that have had to be made. As you know most Americans eat out a lot. And now they're not. And as we get in, if the stay in place orders if they persist longer into the sale season then how you get the produce to the consumer is going to change. Since I don't eat out. So you're not supplying restaurants. So a lot of our wholesale distributors now are getting into the home delivery business for the next couple



months. There's a lot of changes in the food system to convert from sales to retail food establishments, to going into supermarkets in selling to the public.

- I know it's kind of early but have you seen a shift in different new crops that are being planted due to this?

- No, it's pretty much business as usual. The food is essential part of our, the food is an essential item, and so it's not going to be affected directly. Indirectly sure, there's going to be different things that affect whether or not people are going to go, Well, let's look at a watermelon for example. Why do people buy watermelons? Well they're going to have a picnic or take it to the beach. Well, they may not be able to do that. Is that going to affect sales? Don't know.

- Good point, thank you.

- All right I think that's the end of our questions, but do you have anything else to add about what you can kind of suggest to some of your growers out there you know about how they can kind of plan for the future or just kind of, what to expect coming up? Just kind of like staying relaxed and staying in their lane and getting ready to just do business as usual. As you said. Just kind of, what's your message to them?

- Well, I would say as with everybody that is deemed essential in the food system is play your role, you are one of the heroes, so to speak. Because you are providing food for our nation and just continue to do your best. Expect some unexpected, but you're essential to our whole nation. So that's what I would say.

- We have secretary Michaels Scuse with us he's the Secretary of Agriculture for the State of Delaware. And he leads the Delaware Department of Agriculture. In 2017, Michael T. Scuse was reappointed by Governor John C. Carney as Delaware's Secretary of Agriculture. Secretary of Scuse previously served with the U.S. Department of Ag, as Acting U.S. Secretary of Agriculture, Acting Deputy Secretary of Agriculture, and Undersecretary for Farm and Foreign Agricultural Services. As Undersecretary he oversaw USDA Farm Service Agency, risk management agency and foreign agricultural services. He served as Delaware Secretary of Agriculture from 2001 to 2008 and also served as Chief of Staff to the former Governor Ruth Ann Minner. Secretary Scuse and his wife Patrice live in Smyrna on corn, soybean and wheat farm. Again thank you for joining us.

- It's my pleasure Blake, and now that you read that people all across the country know that I can't hold a job. So thank you.

- You are welcome, you are most welcome. Okay so this morning we wanted to talk to you about, you know we have a special episode of our podcast it's called Extension 302. And we wanted to talk about how the COVID-19 pandemic is affecting Delaware agriculture. Can you give us a little insight on that of how it's affecting agriculture in Delaware?

- Blake it's affecting many different segments of agriculture. Probably none more so than right now our poultry industry. Because of the numbers of workers that we have in the plants and the extra precautions that they're having to take now to protect those workers. To make sure that they've got an adequate staff for the operation of those plants. So mean they're doing extra cleaning, sanitizing what they're doing in the break rooms. They've taken and removed tables so that they can practice the social distancing in the common areas. I know in the bathrooms would you would have you know mostly twice a day. Those now or before being sanitized several times a day. What the company's now this week and started to do, they started to take the temperatures and ask questions of the staff and every workforce before they actually go into the plants. So there's an awful lot of additional requirements and safety precautions that have been put in place by the poultry industry. And it's a critical industry, quite frankly, that we have to keep an operation. If you look at the demands for meat products and especially poultry products right now across the United States. These plants are critical to helping us feed our consumers, not just here in Delaware and in Northeast, but across the whole country. So those are extra precautions that they've taken place. We have an issue now with getting an adequate supply of H-2A workers here in the United States. We have quite a few our businesses here in Delaware that require a H-2A workers. And there's a great deal of concern that should this situation continue for weeks or months, that we won't have an adequate supply of H-2A workers. Now having said that, I know that United States Department of Agriculture has been working very closely with the State Department to look at ways that make you streamline that process, get workers that have been in the country before get them in here and then look at ways that maybe we could get some new workers into that H-2A program. Which is, the problem right now, because we don't have the ability to do in-person interviews in Mexico and some of the other countries. Because of lack of staff and because current staff in fact are taking precautions against the coronavirus. So that's an issue for our fruit and vegetable farmers in the state and a great deal concern with them about having the ability to an adequate workforce in the state. So precautions, our chemical and fertilizer companies are the taking additional precautions. Right now we've got requirements in place about keeping people from other states out of the state of Delaware. So we've been answering questions for those that are in the agriculture industry. But it is deemed, the agriculture industry for the most part is deemed critical by the federal government, as well as, by our state government. So we're answering those questions right now because there's concerns about them and their workforces as well.

- Roger that, thank you and what about is foreign demand or any of that affected by this and is it affecting what the bottom line of the Delaware farmer?

- It certainly is. When you look at the grain prices have gone down. The dairy prices also have gone down during this time. The foreign demand is decreasing and because of that we're seeing our pricing go down for the products that our producers normally would be receiving. Our grain prices again are dropping because of demand. The Dairy Pride prices have been dropping. There was relief. We did see some price increases for the dairy sector that at least got them to a break even point. Because of the four-year low that they've been having. But now that price has gone down again below their break-even production cost. And again I think a lot of it is due to that the lack foreign demand for our products. And it's not just a foreign demand, but we're having the issue of shipping products to other countries from our ports. And receiving products from other countries because of port facilities in other countries. China is just now getting back to some point of normalcy. At some of their port facilities there was a major issue and getting containers unloaded in

China and then reloaded to ship products back to the United States and other countries. So that the virus definitely having an impact on trade not just here in the United States but worldwide.

- Awesome, thank you.

- Secretary Scuse, Dan Saracen, before I get into how great DDA is and how they've been supporting our ag industry. Can you just give some of our listeners that do not really understand what an H-2A means, as far as employees?

- Well, thank you, H-2A is a federal program where we get workers, guest workers in from other countries. And there's a whole process that they have to go through in order to be eligible to enter into the United States. But it's a way for our those in the agricultural industry to make sure that they have an adequate workforce either for planting or harvesting crops or dealing with other agricultural issues. So the H-2A program is his one that is federally set up to help our producers make sure that they have an adequate workforce for their businesses.

- That's one of the best definitions I've heard, as far as that program goes. And when you were talking, dairy industry is very dear to my heart. And I when you were talking about Class three basically futures have dropPed \$5 in I don't know how many weeks. And like you were saying. And so it goes back to it's different from the days that you farm, your parents farm. This is not a local economy anymore. It is a international economy that out farmers need to be aware of and pay attention to correct?

- You're definitely correct. It's a global economy. And pretty much all of our ag sectors now rely on a world market for pricing. I know a few years ago we were exporting up to 17%, of our dairy products and with that, you saw an increase in pricing And then when the market became flooded, because of issues with China devaluing their currency. The European Union taking their quotas off. Milk prices here at that time we're at a record-high. So we had a record production and you add those three things together. And that's basically why you seen such a large collapse for any extended period of time for milk pricing here in the United States and again we were just getting back to where our dairy farmers were at a break even price. And and now unfortunately with the decline they're back to it to losing money again. And it's unfortunate, I know last year in Delaware we lost I believe, five of our dairies. We're not a large dairy state but the industry is still important to us and to our consumers. We lost about five of our producers. And we lost our number two and number three producer here in the state of Delaware. And again it all goes back to pricing and making money. And there's a point in time where unfortunately our dairy producers are having to say enough is enough and cutting their losses. And when you look at the losses of dairy farms across the entire United States, it is very troubling. Because these are these are family farming operations that have been in the family for generations and in many cases are multi generational, where you have a father or son and daughter, or grandson and granddaughter on these farms and they're getting out and that's a huge loss to communities not just here in Delaware but across the whole country.

- Yeah, I agree as of yesterday on my count, we are looking at we're less than 20 dairy farms in the state of Delaware. However, we're looking at, what we have four creameries in the state making ice cream. So we're small but mighty. So we gotta give kudos to them, reaching in and finding a niche market and trying to sustain what they're doing.

- That's a good point and I tell you what, those dairies that have their own creameries where they're making ice cream. Look I've sampled ice cream from each and every one of them and you're not going to get it any better ice cream at any store or anywhere in the country than these on farm creameries are providing to to not just our citizens, but to those regionally. And I'm a sucker for good ice cream and it's some of the best.

- Yeah, everybody always says, we'll who makes the best ice cream, I said who ever gave it to me last.

- That would be a very good answer. That's my answer from now on.

- So I want to get back to, I get off topic so Blake's our focus guy, he keeps me on track.

- Believe that is you will.

- So what currently are in the books or what are you doing or what have you been doing to help continue support of our ag community during this song COVID-19 outbreak?

- Well, there's several things. I mean when you look at the the relief package, the \$2 trillion dollar relief package that was passed and signed by the president last week. There's considerable amount of monies in there for agriculture. It gives the Department of Agriculture funding to replenish the Commodity Credit Corporation. Which is where they pay a lot of their program funds out of for the different agriculture programs. There's money in there for specialty crops. There's a letter that is being circulated right now and in the Northeast about providing some of that funding for our dairy farms across the Northeast, our National Association of State Departments of Agriculture is going to be very involved in making recommendations on how that additional funding coming to USDA should in fact be spent. I think we're all going to push for a third round of the market facilitation program because our grain producers especially have not got the relief that everyone anticipated with the signing of the trade agreement with China. So we're going to be pushing for another round of that program as well and look for ways that we can make sure that the funding this coming out of that \$2 trillion dollars is enough of its going to make it way to agriculture to make a difference. Here on the home front, we're working with our agriculture community to make sure those business that have been deemed essential are gonna to continue to operate as effectively and efficiently as possible. But still within the guidelines that the federal government and Governor Carney have set down. Especially when it comes to social distancing. That's something that I don't think people are taking as seriously as they should be. We're seeing our numbers increase here in Delaware not anywhere near like are neighboring states fortunately for us and hopefully we won't, can see our numbers rise to the point where our neighboring states \ have currently. So, we're working with those producers in the agricultural industry again to make sure that they're practicing all the good

policies and procedures that need to be in place to protect their workers, as well as, the citizens here in the state of Delaware.

- Correct, so talking about social distancing and rolling out programs. One of the reasons that me, Jake and Blake and Katie decided to do a podcast is as an extension we have to alter how we roll out our programs and reach our producers. How is DDA handling of reaching out to their clientele and making sure that everybody on this you know gettin' reached?

- Well, we still have our inspectors in the field, but they're taking as many precautions as they possibly can. If we have complaints from nutrient management, we're dealing with those as best we can. The same with the pesticides. You know one of the things that and we weren't thinking about it until we actually had to postpone or cancel, the test were tests for the pesticides' applicators. We had 80 people that were supposed to be tested last week that desperately needed a license in order to work or run their business. And so we're looking at being creative. We're looking at maybe being able to do the testing in the parking lot every one remaining in their vehicles and that way we can get those that really need to have that license get them licensed without exposing them or our staff. So that's one way we're looking at being creative to help the agricultural sector continue to move on. And again we've got a different weights and measures inspectors, but we've pulled them out of the supermarkets, where we know we have you know a lot of people, a lot of the public going into. We looking out for their safety as well as the safety for the public. So we've given them other assignments that are less risky, where they're not going to be dealing with large numbers of public. Answering calls from all of the farmers. Call yesterday from a producer who needs to start planting within the next couple of days, a vegetable crop. Answering questions that they have about their ability to continue to operate and function. Fertilize companies, you know, we may end up to a point where we're going to have to issue letters on the department letterhead stating that drivers or workers are actually critical and have the ability to cross state lines or to be on the highway. So we're preparing for that, if in case it does come to that. Now hopefully businesses will be able to provide their staff with a letter on their own letterhead stating that their business has been deemed critical and hopefully we hope that that'll be accepted by the authorities. If not then we're here and prepared to issue letters and department letterhead stating that these businesses are critical. And I think everyone has to realize that this situation is changing if not daily, but hourly. So we need to make sure that we have the proper workforce here at the department to deal with those changes as they come along. So that we can relay any changes that need to be relayed to different sectors of the agricultural industry.

- Yeah I, like you said this is an evolving thing and changes are going to be expected and challenges are going to be there. That we're just going to have to deal with. On a lighter side I think we should reopen the drive-in movie theater there in Felton and we can do a pesticide certification there.

- Yeah, you know it's really unfortunate those drive-in movie theaters went by the wayside, because we could certainly use some of them now with the social distancing and people getting, like myself bored when you go home in the evening or on the weekend. So, yeah, that'd be a good idea. But unfortunately we've lost all of those drive-ins and I don't know that the younger generation would even know what a drive-in movie theater is.

- Nah, I talked to Jay yesterday he had no idea what we're talkin' about.

- That what I figured.

- Well that leads into the next question of what resources federal and state are available to assist farmers who may face challenges during this time?

- Well again we're here at the Department of Agriculture and we're trying to do business at as best we can during this situation. I know that our federal offices, although they may not be staffed. You still have the ability to contact your local Farm Service Agency office, The Rural Development office and our local NRCS office. They're still taking calls and I know that USDA is working on now how to distribute the funding that came out of the relief package that was passed to the last two, that was passed last week. So yeah time keeps running and you lose track of time when you're in these situations. But so farmers that have questions we're here to answer them. And I know our federal partners are there to answer question from the agriculture community. We would like for agriculture to run as near normal as it possibly can. We're getting into a critical time now, again with some of our crops being planted started in the next few days. And you're going to look at the grain, planting a corn crops being done probably within a couple of weeks if the weather turns around and straightens out. And we stop getting all the rain and it warms up. So but it's a critical time right now. We still producers that have grain in the tanks that need to be moved. And our poultry industry continues needs to continue operating. So but we'd like to get the ag sector as running near normal as it possibly can be.

- Thank you.

- All right, thank you a lot great information for the agricultural community and the community as a whole. So to wrap things up, what is your message to Delaware farmers that may be anxious about challenges of the COVID-19 pandemic?

- Well, a couple things. Number one first and foremost I think they need to understand that, you know, if we continue to work together and we take the proper precautions that eventually and hopefully sooner rather than later, we're going to be able to get through this very difficult time. And as I pointed out, we need the agricultural sector to continue to operate as near normal as they possibly can. We have the greatest producers to be found anywhere in the world right here in the United States and I repeatedly said that some of our best producers in the United States are located right here on the Delmarva Peninsula. So we'd have consumers out there that are going to rely on and count on agricultural producers to keep those store shelves fully stocked. So we need them to continue to operate as best they can. We're here to help. And I know that our federal Partners or are here to help as well, but make no mistake about it. We're going to get through this and we're going to come out on the other side and we'll be stronger and better than ever before. So just do the best job that you can. And if you need to help give us a call.

- Thank you for joining us for the inaugural episode of Extension 302. We hope you enjoyed today's episode and will come back for more. In the meantime please subscribe, visit us online at

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