

What are the Long-Term Ramifications of the Coronavirus Pandemic on US Agriculture?

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“May you live in interesting times,” was a saying my dad used when I was growing up. When I reminded him of that this past spring, he swears he didn’t mean for it to turn out like 2020.

“Covid-19,” as it’s been named by the powers that be, has been the spark that lit fires all over the world. Regardless of one’s political stance, it’s impossible to deny that we’ve seen more changes in the day to day life of this country over the past six months than we have in the past decade.

Corona viruses are a very common family of viruses; many of you vaccinate against them in your cattle with *Scourguard/Guardian* or *Bovalis*. One branch of the corona virus family causes the common cold, another causes calf scours, one maybe causes the old nasty Winter Dysentery, and one started out causing a terrible mysterious pneumonia in the Chinese city of Wuhan sometime before this past January, and spread rapidly from there. That last one is called SARS-COV-2, and it causes the disease known as Covid-19. This is a completely novel corona virus, one that the world has never seen. Some experts see evidence in the genetic code of this virus that it was engineered in a lab, and there are just as many who feel that it was the result of random RNA mutation. Although we may never know the exact origin, we do know how dangerous it can be for some people.

To actually cause disease, a certain number of infective virus particles need to gain entrance to our body. The particles come in through our mouth, nose and eyes. It is mainly spread via droplet transmission, meaning that it is found in the tiny drops of moisture that come out of the mouths and noses of infected people. Those droplets generally don’t travel very far from the person who expels them; their relatively large size makes them usually fall to the ground within six feet, hence the “Six-Foot” social distancing rule we’re all trying to remember to follow. There is increasing evidence that there may be some aerosol transmission as well, meaning that the virus might be able to float in the air for a very long time, possibly as long as 6 hours, to be inhaled by some poor soul who walks by. That transmission mode is significantly harder to cope with. Fomite transmission, which happens when the virus is literally picked up by someone touching a surface that has virus particles on it, has been documented as well. This is why business and public places like schools are trying to so hard to disinfect regularly, and why hand washing is so effective. If we get the virus on our hands from an infected doorknob, we need to touch our eyes, nose or mouth to get that virus where it gains entrance. If we wash our hands before we touch our face, regular soap will denature the virus, rendering it completely inactive, and therefore unable to infect us.

There has been much research done on this virus over the past six months, and some things are starting to become clearer. What was originally thought of as a variant of the classic viral pneumonia, like what we would see in a cow with IBR or BRSV, has now been refined so that it looks like we may be dealing with a virus that causes two other big problems.

First, Covid-19 causes widespread severe inflammation throughout the body, very similar to what we see in a cow with watery, toxic mastitis. We’ve all seen those cows that have a little off colored milk in the morning, are down by the afternoon, and are dead before the sun comes up again, no matter how many bottles we run into them. Those cows die because their immune system reacts excessively to the gram-

negative bacteria infecting her udder. Instead of causing inflammation just at the site of the infection, the inflammation happens throughout the entire body and causes all kinds of terrible problems, sometimes resulting in death. The immune response works wonderfully in most cases, with targeted attacks of the invading germs, but in cases like some toxic mastitis cows and some Covid-19 infections, the body over-reacts, and uses a nuclear bomb to clear the infection, when a swat team would be more appropriate. We don't completely know why some cows get watery mastitis and just lose the quarter and others die from it, nor do we really know why some healthy people get Covid-19 and have a bad cold and other perfectly healthy people die.

Second, Covid-19 seems to cause a blood clotting disorder. It appears that some of the clinical signs of pneumonia are from the horribly severe inflammation in the lungs, like a shipping fever, and the other impact on the lungs is actually the result of millions of microscopic (and sometimes big) blood clots forming. These clots flow into little blood vessels and dam up blood flow into parts of the lungs, resulting in the death of the tissue that those blocked vessels were feeding. Those same miniscule blood clots can end up blocking blood vessels in the kidneys, the heart, the brain, and many other parts of the body as well. This causes multiple organ failures resulting in death or permanent damage, as well as long term health problems that we are only just beginning to see.

Humanity has been dealing with pandemics since Biblical times. From Moses up through the Black Death of the Middle Ages, the Spanish Flu outbreak of 1918, and the many smaller disease breaks we don't even remember, we've always known a silent killer could begin striking down our species at any moment. Until recent times, the only way to combat a disease break in livestock or people was with what are called Non-Pharmaceutical Interventions, or NPI's. These are things that organic farmers are very familiar with, as we don't have a shot for most things, and need to lean on the old adage that "An ounce of prevention is worth a pound of cure." NPI's don't rely on medicines or vaccines, and instead are interventions such as proper hand washing, social distancing, quarantines, and face coverings. Those old-fashioned methods are still the most effective way of making sure that we don't get or spread this nasty new virus. The pharmaceutical interventions are of course still being researched, from fast-tracked vaccine development, to things like hydroxychloroquine, ivermectin and dexamethasone and even our old standbys of Vitamin C and Vitamin D. The jury is out on which are the most effective therapies, but every idiot with a Facebook account is an expert, even if they don't know dexamethasone from dextrose. No matter what any expert says is the best treatment, the ideal plan is Just Don't Get It. Those of us who work with cattle know from experience that the best defense against any disease is to make sure the immune system is in tip-top shape. Eating a healthy diet, getting adequate sleep, having regular physical activity, and reducing stress are the keys to preventing any disease, and this one is no different. Another parallel from the cattle world is trying to reduce spread by minimizing opportunities to co-mingle different populations. Just like a sensible farmer won't haul a sale barn cow into a tie-stall in October, the recommendation to have out of state travelers quarantine before going out into the general population is designed to make sure that those folks don't bring this new disease to an area that doesn't have it. This is also the thought behind some of the changes that have been proposed as our children go back to school in cohorts, with reduced chances to share the virus back and forth if someone would come to school carrying it. Also, although masks have been seriously politicized, the bottom line is that they are effective at reducing the spread. Those droplets we discussed earlier get caught in your mask when you cough or talk, and never make it into your neighbor's lungs. Not only do they help minimize the chances of you giving it to someone else, they also can reduce the number of infective particles you might breathe in should your neighbor come cough in

your milkhouse. Breathing in less virus makes it more likely that you either won't get sick at all, or that if you do get infected, your immune system will have a chance to clear it before you get deathly ill. It is actually looking like as much as half of our population may have some innate immunity that prevents them from getting severely sick from Covid-19. The most recent thought is that this immunity is likely connected to immunity developed from repeatedly fighting off the corona virus that causes the common cold. This may be one reason why children seem to be so rarely infected by Covid-19; every kid in the world walks around all fall with a snotty nose, most often due to that common corona cold. The corollary to this is that folks with some common pre-existing conditions are at significantly higher risk than the general population. Old age, obesity, heart disease, diabetes, and having a reduced immune system are all risk factors that make a person much more likely to get sick and die from Covid-19.

Besides the awful damage that this disease does to some people who get it, the most pressing concern currently is the economic impact of both the sickness caused by the virus and the resulting government response.

Much of this concern is due to the fragility of the global supply chain. This country has little manufacturing left, both directly in ag-supply and upstream as the suppliers to the plants that are still here. Eighty percent of all the world's medicines are produced in China and India; the last plant making penicillin here closed in 2004. We can no longer self-sustain in the event of major disruptions to other countries, especially China. Recognizing this fragility and the fact that we need certain supplies to do vet work, earlier this year my wife bought us a six-month supply of rectal sleeves, surgical gloves, local anesthetics, etc. These are things we can't run out of. So instead of maintaining a very lean inventory to keep costs down, we decided to keep much more in stock when we could. We're definitely NOT recommending that folks panic and hoard things they don't need, but if each of us could take a look at what we need to keep our operation running and maybe get it now instead of waiting until we need it in three months... the difference between your vet getting you the last bottle of epinephrine available and not getting one at all is about five seconds with the office secretary on hold with MWI. Your business and family are dependent on having healthy, well fed and cared-for cattle. My business and family are dependent on you all having those cattle and being able to take care of them. A little bit of planning today will likely get us all better prepared and make the always busy dairy world more manageable.

The government response has varied widely from state to state, but in every case, we've seen tremendous shifts in how people behave. With everything as connected as it is today, small tremors in one part of the economy can translate into earthquakes in another area. As most of us are aware, the local food trend popped into road gear in mid-March, along with a huge surge in gardening, raising some livestock, and living more like most of the readers of this article did already: a little less dependent on the big wide world. Here in Maine we've seen many out of state people looking to buy a little land and move out of the city. These trends will likely continue to accelerate. More people are recognizing the idea that we live in a very fragile world, and knowing where their food comes from has gotten really important. It's amazing what bare grocery store shelves can do to a city person's confidence; all of a sudden they wake up to the fact that milk comes from a cow not a carton.

This next part is my opinion and mine alone. It's not the official stance of anyone, nor should it be yours without doing your own research. I think there are a number of things that we might see going forward. Direct food sales to the consumer are booming, and in many places will continue to do so. Commodity

agriculture will likely see more severe price swings; the highs will be higher and the lows will be lower, causing continued consolidation in most sectors of agriculture. The Federal Reserve will likely continue printing money like it's going out of style, and this will continue to enrich those closest to the printing press, i.e. Wall Street, multinational corporations, and the already wealthy. Those on fixed incomes will feel the coming inflation first and worst, the middle class will likely continue to hollow out, and the divide between the top 0.1% and the bottom 90% will continue to widen. Even so, it won't be out of the realm of possibility to see more direct money transfers to the general population. Once the voters have tasted the sweet fruit of free money, they, like the big banks after the '08 Financial Crash, won't want to give it up. Most politicians care deeply about re-election, and won't want to be labeled as the candidate who cut off Granny's grocery budget. Fuel prices will likely go up considerably. Even as demand has fallen off a cliff with decreased economic activity in the world, the devastation in the oil patch caused by the past few years of low oil price means that there has been less new oil exploration and less investment in maintaining the infrastructure needed to keep these prices low. This will catch up to us soon. Even though we're furiously trying to adopt green energy solutions, the truth is that we still run our country on oil, and as that goes up in price, everything else follows. That, along with the trillions of dollars printed out of thin air over the last decade may come together in a whirlwind that makes the stagflation of the late 70's look like a spring breeze. Those in possession of real assets: productive land, timber, minerals, etc. will eventually be the ones who do the best economically, although it may be bloody between now and then. There will be a re-pricing of absolutely everything, and the market signals will continue getting increasingly impossible to read. Change will become a constant.

The things that will help us ride through the coming storm are the things that have always been important, but our country seems to have forgotten. Being of strong moral character, having good community around us, recognizing our place in the world literally, figuratively, and spiritually.... These have been the bedrock of our society and will be again. As stewards of the land and the creatures on it, we have been given a sacred responsibility. It will be up to each of us individually to how best to live up to it. I truly believe that the other side of this will be a new dawn, a green spring after a hard winter. Our future is bright; it might just be hard to see from here.