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AGRILINKS WEBINAR: ADDRESSING FOOD SAFETY IN ANIMAL SOURCE FOODS FOR IMPROVED NUTRITION

WEBINAR AUDIO TRANSCRIPT

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Jennifer Lane:

Thank you, Carla. Hi everyone out there in webinar land. We are thrilled for so many people to have tuned in today. We have a really excellent lineup of speakers who you've already heard are from all over. The webinar today is the third in a series of TOPS funded events focused on livestock, animal sourced foods, and household nutrition. The next event will be in Nairobi in May.

Please go to our website for materials from previous events and there are presentations, Power Points, videos, and more resources, and if you'd like information about the May event or have colleagues in Nairobi, please direct them to the information sign-up form on the page and you can see the link that's about our livestock nutrition learning series right there on the slide. Okay, on to today. We are going to look at addressing food safety and animal sourced foods and its potential for impacting nutrition outcomes.

Apologies for the slide going crazy right now. We're gonna work on that. To help explore this topic we're gonna hear from a panel of experts in this field. We wanna keep this brief and maximize their time to speak. Their bios are available on the slides as well as on the Agrilinks website. First we'll hear from Dr. Andrew Bisson of USAID Bureau for Food Security in Washington DC. He's gonna set the table on why this is an important topic to focus on.

Then we're going to hear from two researchers from the International Livestock Research Institute, Dr. Hung Nguyen-Viet in Hanoi will speak about using a risk assessment framework to evaluate pork and fish value chains in Vietnam. Dr. Silvia Alonso will tell us about working with informal dairy markets in Nairobi, and finally Dennis Karamuzi will discuss a multi-pronged approach to cleaning up the milk supply in Rwanda. Dennis suggested that we serve tea today, so please enjoy a virtual cup of tea from Tagali.

Following the presentation we anticipate a rich discussion, so please type your questions into the chat box. Lastly, I'd like to express a sincere appreciation for the participation and the patience of our webinar speakers. Webinars are a lot of work, so thank you very much, and thank you very much to Agrilinks and Microlinks for hosting the webinar. Okay, over to you, Andrew.

Andrew Bisson:

Back again, folks. Here we go, second time, take two. So I'd just like to thank Land O' Lakes for hosting this series of webinars. The role of animal sourced foods in food safety is an important and perhaps neglected topic but one which I'm sure will continue to grow and grow in importance as the livestock revolution plays out. My introductory comments are intended

to set the scene for today's expert speakers and I'll briefly recap – just advance the slides here. There we go. Great.

So I'll recap the drivers of rising demand for animal sourced foods, the burden of disease relating to those animal sourced foods, and then introduce some of the challenges and promising approaches particularly when we're working in informal markets. Previous webinars in the series have highlighted the important role livestock plays for more than 1 billion livestock keepers: poverty reduction, improving nutrition, and building resilience, the key pillars of USAID's new global food security strategy.

Safe and nutritious foods are critical to the development of a well-nourished population particularly young children and mothers. Animal sourced foods provide high quality protein and micronutrients even when consumed in relatively small amounts. However, and this is the big "but", it is critical that animal sourced foods are safe as well as nutritious, otherwise we take one step forward and one step back. Food systems are undergoing rapid and substantial changes, shaped by powerful drivers in emerging economies.

This is taking place at an unprecedented rate and propelling massive growth of the livestock sector. What people eat, where they eat it, is also changing. The so-called nutritional transformation. This includes the consumption of more animal sourced foods. These are complex, dynamic systems with significant interactions, coevolving and continuously adapting. These systems create conditions which pose challenges for food safety. For example, with agricultural intensification of production systems we see highest stocking densities, increased contact rates, greater potential for disease transmission, increased use of antibiotics, and associated problems, and potentially the emergence of new diseases.

Population growth, urbanization, globalization are all elongating supply chains, making greater distances from the production to the consumption zones, challenging traceability, storage, and making demands on a coal chain that can barely cope. There's an increased need for coordination against the growing number of actors within these food systems. These changes generating embedded risks resulting in some unwanted outcomes such as foodborne disease.

These problems can be difficult to address where there are limitations in the governance of the food system, and weaknesses in the enabling environment on top of the existing surging demand for animal sourced foods. The policies, institutions, practices, regulation, and infrastructure are all struggling to keep up with the pace of change. This graphic shows the percentage growth in the consumption of animal sourced foods. We should

note in the high-income countries shown here in blue, demand is actually leveling off. It's plateauing.

The majority of the increased demand is coming from the developing countries shown here in red and green, and that growth is substantial. Projections estimate milk consumption in Africa is likely to triple by the year 2050. Poultry, meat, eggs, whole animal sourced proteins are all surging and there will be huge increases in production and consumption. So the good news for the livestock sector is animal sourced foods are nutritious, they are in demand, and there is a long-term trend for robust growth. So then what is the bad news?

The bad news is that animal sourced foods significantly contribute to the burden of foodborne disease. Foodborne disease is clearly recognized as a health issue, but estimates of their actual burden haven't until recently been made. In 2015, WHO completed a landmark report, the title page there pasted on, *Estimates of the Global Burden of Foodborne Disease*. This recognized the burden of foodborne disease as a massive problem much underestimated prior to this report. Somewhere in the vicinity of the burden of disease for an HIV or a malaria or for TB, so really huge problem.

Then some striking statistics coming from this report. 33 million dallies are caused by animal source foods. That's the disability adjusted life years or healthy life years lost. 600 million foodborne disease illnesses every year. That's one in ten of the whole global population. This leads to 420,000 deaths per year. Sadly, much of this burden is carried by children who experience something like 40 percent of the burden of disease, and perhaps again sadly and not surprisingly, much of that burden is born by the developing countries who are least able to cope with it.

These numbers are hard to grapple with, but I think the key takeaways from the slide is just the sheer size of this problem. But also on the positive side, most foodborne diseases are entirely preventable and we should take encouragement from that. So what is causing these foodborne diseases? Various studies on the meta analysis of them have shown that between 30 and 80 percent of foodborne disease is of animal source food origin. This is an issue the livestock sector must deal with. There are three broad groups of pathogens: the microbial pathogens, the viruses and bacteria, foodborne parasites, _____ protozoa, and toxins including mycotoxins and chemicals.

The graph here shows the relative contributions of these groups, and I saw in the quiz at the beginning you guys are spot on, that it's the microbial

pathogens that really are in the top spot, often resulting in diarrhea, which accounts for at least 50 percent of the burden of disease. The foodborne parasites are also a significant contributor, and toxin including the mycotoxins are a significant issue. Maybe underestimated in this graphic, and we know very much the linkage between the mycotoxins and stunting and immunosuppression, and that's been the subject of previous Agrilinks webinars which I'll refer you to.

This graphic provides a regional breakdown of the problem. It is not consistent as we can see. Note the marked regional variations in the overall burden of foodborne disease. You see on the left there that Africa carries the majority of the burden with Asia as a substantial contributor too, but if we look, and I've circled Europe, just to give us an idea, there are very low levels of foodborne disease in Europe. Again this point that this is a solvable problem that it is possible to get the burden down to very low levels.

The second point is to note that the distribution of different causes of foodborne disease varies quite markedly between the regions. So diarrheal disease is predominate, the blue on this chart, particularly in Africa, but in other regions _____ parasites have led in the West Pacific and some of the Americas, the _____ parasites can be more of a bigger problem.

Wet markets and the informal sector are generally where most people obtain their fresh food and where many of the key risks land. Formal markets are not however necessarily safe, and informal markets are not always high risk. Regulatory control interventions can seem like the way forward, but experiences show that this is difficult and problematic. Approaches to close down informal market channels or overzealous regulation have not generally been successful and in many cases can often do more harm than good.

Whilst today's topic is focusing on food safety, there's a need to be mindful and to balance between the multiple desirable outcomes and competing priorities that face us as development workers. Improving food safety yes, but also we must preserve access to affordable and nutritious food and support livelihoods of those producing that food. Sorry, I just wanna go back.

So the final slide here, foodborne disease is a solvable problem, and before we travel around the world to hear from our expert presenters, here's a menu of some proven impactful approaches and practices. A farm-to-fork approach application of control interventions at multiple points in the food chain. The use of risk management as a systematic and objective tool to guide interventions.

Engage the formal sector; that's where the risks are. Work with, not against stakeholders and seek inclusive pathways to encourage progressive formalization. Align policies and practices with incentives. Use scalable appropriate technologies, and strengthen food system governance. And that is my cue to hand over to Hung in Vietnam.

Hung Nguyen-Viet:

Thank you very much, Andrew. Good evening from Hanoi. It is now five 'til 10:00 PM. I would like to talk about the risk assessment for food safety management in Vietnam. Actually this is a dear topic to me and to our group. As you can see here, it is actually coming from a very great research partnership between International _____ Research Institute and our partners in Vietnam including Hanoi School of Public Health and Vietnam _____ University, funded by Australian Center for International Agriculture Research and _____ program _____ health and livestock and fish.

Actually I will focus on three key points. The first is in fact the context of food safety in particular in informal markets in Vietnam. The second point I will highlight some of the studies that we have been conducting in Vietnam on pork and fish value chain in a more umbrella context of _____ and eco health, and finally I will have some reflection on the translation of research evidence into policy in Vietnam. Actually it's very timely to talk about _____ in Vietnam because if you are in Hanoi you can see a very great atmosphere of the Lunar New Year in Vietnam and China is coming up in two days in fact, and most of the Vietnamese are on holidays now, but food safety is important for them.

One of the recent research by USAID showing that food safety is a more pressing issue for Vietnamese population. It is easily more important than education and healthcare for them. So to address this, the Vietnam government has been setting up rather modern food safety framework that requires the use of risk-based approach, however the _____ showing that application _____ not very strong at the moment. Also another issue really is the perception of general population.

It's very much on the issue of chemical hazard, chemical contamination of food, and in the city in urban environments and some other places in Vietnam people are really willing to pay more to have safer food for them. If you look at the global context as Vietnamese we are quite good in _____. So we comply with international standards for our seafood but also other agri products, but when you look at the domestic market the _____ is a little bit not very positive compared to export environment. _____ the situation.

And now coming back to the animal sourced food, meat, milk, and eggs, and actually I want to focus more on pork. This is very important in Vietnam because in this region _____ meat that Vietnamese people eat. So we eat a lot of pork. We had basically 28 million _____ population in Vietnam and _____ of pork per year. So that is quite a high level of pork consumption. The interesting thing here is in fact more than 80 percent of this pork is mainly produced by very small and small farm. The farm varies from 1 to 3, 4, 5, 6 is considered a very small farm, and it can go until about 100-150 _____ farm.

So this is really a popular thing that we are having in Vietnam. Also you see the particular _____. In fact we have many very small, small _____ house, about 30,000 _____ house in Vietnam for 19 million people. You can see that it's quite small _____ house dealing with maybe 10, 20 picks a day. So from the highest _____ it's not easy to manage. Another point of the Vietnamese population is in fact they want to eat the fresh pork soon in the _____ and informal market. We don't _____ a couple of markets supply basically from 10 to 20 percent depending on the city.

So the implication of that is in fact it's quite _____ from the informal market that address the local demand, however some challenge can come from the food safety side that it's not very _____ for control. When this happens you can see that potential reach for public health when they consume food, and it's very important for me to including _____ as a set of risks and hazards in the context we are talking. In the next problem we'll come back to that.

I am sure that you know already, but just to remind, hazards are defined as anything that has potential to cause a negative impact on human health. For example, salmonella, from bacteria, _____ antibiotic is own – how to say – item, _____ hazards that has the potential to cause a risk for people. The risk is not necessarily as a hazard. The risk actually is a combination of the likelihood that something bad happens by this hazard we just mentioned. So combined with the consequences it means it's the severity of the consequence goes by the hazard. So please make sure that you mark the difference between hazard and risk in the context of discussion today.

This brings me now to showing you some examples, concrete examples that we have been doing in Vietnam. So the question posed in the _____ so we eat a lot of pork in Vietnam which we _____ market. So what are the risks caused by the consumption of pork in

Vietnam? For that we use a so-called risk assessment approach from farm to fork, really fork to farm _____ into the table where people consume pork by actually collecting samples from the farm _____ market from these examples like _____ feces from the pig but also pork _____ kidney in the market, in slaughterhouse. But also we did a survey with the consumers to really understand how they prepare, they cook, and they consume the food with potential samples that you can see here, more than 1,200 samples.

And from that here for example I show you the prevalence. It means that this salmonella contamination, so salmonella here is a hazard for our risk assessment context. You can see here basically salmonella is quite prevalent in many samples that we studied. More importantly if you look at the market level it means that we sample pork in the market. The salmonella contamination risk is about 30 to 34 percent, whereas you can see in the slaughterhouse level and producer level you can even _____ 20 percent of salmonella in water. So the environment is not so clean and the contamination is really _____ Vietnamese context.

It's very popular in the Vietnamese context and it's comparable into some of the developing countries if you look at salmonella prevalence. We can see on some other pathogens, for example _____ is the _____ pathogen. Actually it's existing in the black _____ and the implication of that is in fact Vietnamese people, sometimes they eat the raw blood of the pig and where the New Year comes in two days for example, many people eat that, and you see the risks of consumer marketing _____.

The other citing for the studies is you see when people bring pork in the house, when they prepare, they have this kind of cross-contamination. So salmonella from pork can contaminate food _____ salad, other fruit, by using the same cutting board and if they don't clean very nicely, but also it can be contaminated from the knife when they cut the pork. Finally, on this you see collection of data which from modeling and simulation, etc. combining micro _____ and also _____ some of these _____ for example basically 12 percent of Vietnamese population has the risk of salmonella.

It means basically one to ten person per year has a problem with salmonella when they eat pork in Vietnam, and we can also show from sensitivity analyzing lab handling _____ at the household level and the prevalence of pork at the market, and the key factors that lead to the risk of salmonella in Vietnamese population. When we looked at the _____ hazard and here _____ technical, it means here in our context, these

antibiotics _____ but also the growth promoters like _____ that was _____ actually by Vietnamese law. Vietnamese people are concerned a lot about chemical hazard, so we want to understand if it's really the risk coming from the chemical hazard.

So for example, many places in the value chain you can see here there's a negative. It's _____ and _____ by positive. So _____ sample a negative for antibiotic _____ and heavy metals except for some of the antibiotics, but the _____ is rather low for that. If you look at here in the next slide you can see that model, the sample, with negative, or they did not achieve the current MRL.

It means the maximum _____ level defined by Vietnamese regulations. So the highlight of this study is in fact even people are concerned a lot about technical contamination from pork _____ we don't see that on this study as a very major issue of food safety in Vietnam at the moment. Let's move now from pork to fish because fish is so very important for Vietnamese diet.

Here I want to show you putting in the context of _____ eco _____, what does that mean? It means that people _____ big fish _____ table in a very integrated agriculture system as you can see here. Vietnamese farmers have very small land so it was there they raise animals, livestock. They have small fish farms where they raise fish, but they have also the crops and the gardens for _____. So everything is interconnected so _____ cycling it is very clear in Vietnam.

So here is _____ if in fact you look at the next slide you have a very polluted water from the channel or from the river coming up from the _____ percent of _____ in developing countries not treated. People can fish in this kind of polluted environment and they eat contaminated fish. So we conducted a study in Hanam Province that 60 kilometers from Hanoi and in fact we examined the level of contamination of tilapia fish grown in this polluted river, and here you can see for example the water contamination level in _____ was quite high for a _____ and _____ both in water from _____ and tilapia. I'm sorry for the type of the name of that.

But when you look, when you do a risk assessment it means we survey how local people consume, how many times they eat tilapia per day, per week, per year for example, and then calculate the portions that people ate. You know the TDI _____ basically the total daily _____ and _____ lower than acceptable level defined by the

country. So it looks quite _____ in terms of pollution, but finally when you come to the risk issue the level is not so huge like people perceive.

You can see also you have a behavior issue here, a knowledge issue playing an important role here in the sense that people sometimes they know that it's polluted, so sometimes they don't eat the fish but they sell the fish to another area. The consumers are not aware of the situation for example. So from a risk communication point of view and risk assessment it's very important to really understand where is the risk and how to manage this risk.

So shortly to summarize from these two case studies on pork and fish, combining these different disciplines to work on risk assessment is important _____. We have an issue of misperception of what people worry about is not necessarily what makes them sick in the case of micro _____ and chemical hazard in our study between pork and fish, and also we do identify the factors that influence the most the risk so that it can _____ to the intervention to reduce the risk.

My last two minutes I would like to share with you our experience on working with policy to translate the evidence, to _____ risk assessment. You know that in Vietnam I said also in the beginning they have a very nice lawful city where they define the risk _____ meaning risk assessment communication and management. However when you look at the _____ level not a lot of things happen in that so far. Among other things that is because of the capacity of local partners but also at the ministry level.

So _____ mention a partner. We set up a nation of food safety risk assessment in Vietnam bringing 20 experts in Vietnam from ministries but also from research institutes and universities to work together to do training and risk assessment but also really doing the hands-on risk assessment for the country. When you have the result in the _____ we approach people from Ministry of Health like you can see here in 2011. We went to talk with people from Ministry of _____ they are in _____ city and _____ and can lead recently to a more comprehensive report led by _____ and the development partners commissioned to _____ partners to bring all this evidence into the _____ level.

For example, we can talk to the people from the _____ prime minister about the _____ in country. That eventually would lead to a larger project to intervene the _____ in Vietnam. Let me conclude by bringing a few key takeaway

messages for you. From our experience we can see that pork and fish are important for Vietnamese diet.

So the question is in fact how to balance the formal and informal market to really control the safety aspect of fish and pork in Vietnam. We can see from this _____ assessment is quite useful tool for food safety management in Vietnam, but we really need to adapt to the local context and also to meet the capacity that is needed to conduct these things.

The _____ is very important, and I think that we need more evidence to show where we need the _____ of risk. Finally, to work with policy makers in these type of countries I think we need to be persistent, opportunistic, and very timely for really _____ our evidence from research into the policy in _____ in the country. I would like to thank you for your attention and I hand over to my colleague Silvia Alonso.

Silvia Alonso:

Thank you, Hung. Hello everyone. So let me take you now all the way down to East Africa. I'm gonna be talking about Kenya, the formal milk sector, the formal dairy sector in Kenya. I'm going to present an intervention that we believe can improve milk safety, can help public health, and can protect nutrition and livelihoods.

So the focus of my presentation will be on milk, and I think there's no question that diverse diets including animal sourced foods are healthier diets. While we think we should cut down on animal sourced foods consumption in the richest countries, it's also clear that the most animal sourced food is needed in developing countries and it is particularly beneficial in the diets of women and children.

Milk is one of the best animal sourced foods in those countries for several reasons. Obviously it contains certain macronutrients that are not available in other products, and in children it's been associated with improved _____ metric indexes. In compared to other animal sourced foods it is relatively cheaper especially compared to meat. It's more available. In any low-income countries you will have cow's milk at least and it's very suitable for children, especially for youngest children.

But obviously in low-income countries what you mostly find is raw milk. It is actually the most available and affordable form of dairy in many countries and this is definitely the case in Kenya. In rural Kenya, and I think it's the same in other countries, raw milk is the only form of milk available. There's no pasteurized milk. In urban areas the raw milk markets consist with the pasteurized milk markets, but still in urban areas in Nairobi there seems to

be precedence for raw milk. In fact it's actually cheaper, can be up to three times cheaper or more than pasteurized milk.

People have their taste and cultural preferences, and you have wide distribution channels. You can find it in so many outlets. There's also door-to-door selling. So obviously it's easier to get. It's cheaper. Obviously most people would consume it. Obviously there is obvious and firm concerns around raw milk and public health. Milk is a highly perishable product and it's a very good medium for the growth of bacteria including some very nasty pathogens for humans.

There's no data really on how much illness in humans is caused by the consumption of milk, but as my colleague Hung was referring to, the fact that milk might be highly contaminated doesn't necessarily mean that _____ percent of risk for public health, 'cause consumption practices also have a say in that. In Kenya the vast majority of people will boil milk before consumption, so they're definitely – that reduces the risks posed by raw milk.

And then on the other hand, here we assume that pasteurized milk is safer. In places where the coaching doesn't really work at times, in the cases where actually it exists in fact, or where people might have a perception of the safety of pasteurized milk without really knowing that in fact it requires certain ways of storage. But anyway, apart from this I think it is the concerns of government are quite fair in terms of the public health risk potentially associated with raw milk. In _____ Kenya the government has been very proactive in trying to address this issue in many different ways.

One of the ways is obviously increasing regulation, increasing the spot checks, and persecuting those involved in such markets. But on the whole these approaches have quite failed, basically. There's been other approaches have been more successful, for example promoting the selling of boiled milk that was sold in the form of dispensers. That seemed to be quite a successful approach, and also something that I think quite promising. Now recently there's been also some concerns around _____ of those and misuse of those.

So no strategy is perfect, but they all seem quite promising. The government lately has been actually trying to move towards a complete ban of raw milk and the promotion of pasteurization of all the milk that will be sold. So this is quite an undertaking obviously by government. We know that the raw milk is commercialized in what we call informal dairy markets and these are disorganized markets with poor infrastructure, lack of coaching, not regulated, often not licensed.

So governments have _____ concerns, but we have to also _____ that in countries like in Kenya and many of the low-income countries, informal dairy markets have a very important role in other aspects. _____ an important role in food security. They provide food for the most vulnerable and the poorest. They are also a force of livelihood for the population. Not only provide jobs and business opportunities but they also pay in the case of the milk higher prices for producers. So they are positive for milk production. In particular they support women and youth. Women and youth are very involved in the dairy sector. Obviously these informal markets support the livelihoods.

So a ban in the informal sector could have unintended consequences that need to be looked at or thought through at least. So I guess my point here, I would summarize it that way, is not that we want these informal markets to stay forever. I mean we do believe in the long-term these markets will formalize, will become modern with more infrastructure.

As countries develop and as the economic capacity of countries grows, but in the short and medium term those markets will stay. So we need interventions that will somehow work with the markets. With any intervention that will try to _____ the formal markets can be ineffective, anti-poor, and gender inequitable. So there goes the main message of my presentation. Again _____ options exist that will protect nutrition, livelihood, and still protect public health. I think that's what we should be looking at.

So I'm going to present to you an intervention that was implemented in Kenya about ten years ago that was quite successful in touching on all these aspects. It was a training and certification of day traders in Kenya. So the traders were getting, which were not licensed by government men or anything, they were just working illegally. They were just being provided with training on quality, milk hygiene, how to recognize high quality milk. They were given business skills and training on value addition so they could actually use their milk to produce yogurt and other products.

And then they will also be getting a certification that actually they could present to the authority and that will facilitate licensing. So obviously that was an incentive for the traders, the fact that government will – they will be somehow legitimized in forms of government. So the traders buy into it, government too, 'cause obviously they felt that was a way of monitoring the informal sector that all the while we'll be working in the dark. It was also a time to be sustainable and self-sustained, touching on all these incentives for all the different players.

So it started after day trading certification was implemented and that was about ten years ago, found that it had improved milk safety of those traders that participated in the trainings. The traders were very happy 'cause they were seeing the milk was a better quality, they were having this _____, the consumers were happier with the milk they were selling. Unfortunately the government buy-in in the long-term was not as strong as it was expected in the beginning, so the approach didn't reach the scale that it could have. Although the same scheme has been implemented in other countries and it's been successful.

So one way or another the scheme in Kenya hasn't been as strong let's say as it could have been. But now we want to give the training and certification another chance. We have a new project that has just started in _____ _____. It's called more milk, making the most of milk, for five years and it's funded by the Bill and Melinda Gates Foundation. We will adapt the training as a certification to implement it again and we want to in fact gather evidence to see how well that can improve milk quality and milk safety and at the same time improve nutrition and health outcomes in children in urban areas in Nairobi. That's our pilot site.

So we will modify this training and certification. We will transform it into a training certification and marketing scheme. The training, we will recruit informal daily traders and we will give them skills on quality, safety, and hygiene. So pretty much towards the similar to what this scheme did ten years ago.

There will be an aspect of certification that will be pretty much a quality mark, so something that the traders can display and show their customers that they are trained, that they are better than all the other traders that are around to build confidence of the customers. And then a marketing component which is promoting the consumption of milk with customers. So working with the traders and working out what are the messages that they can give customers to promote milk consumption especially for children.

Let me just briefly go through what we believe is pretty much the pathways in which this scheme will work to improve milk quality health and nutrition. So I said that the traders will receive pretty much training in _____ quality and on marketing their milk. So we expect that because they learn how to recognize quality milk and how to preserve the milk and _____ there will be less _____ in the milk, less _____ 'cause that is an important problem in Kenya.

So if they can better check the quality of the milk they are able to reject milk that might _____. The quality of the milk would be better as a consequence. So this should be a lead ideally to better _____ and this _____. Because the milk is less _____ and better quality it will be more nutritious, so that will lead to better nutrition. At the same time the marketing aspect will stimulate consumption of milk and especially feeding it to children. And all that is all positive for the consumer. So what are the traders gaining out of this?

So we believe that obviously the increased consumption will obviously result in higher return for the traders. Also the fact that the milk is of better quality will mean that there's less waste. They have to throw away less milk at the end of the day. So again that would just lead to higher returns. Hopefully if actually customers see that better milk and more hygienic milk results in less health problems at the home, that will create more loyal customers. So all that are incentives for the traders to effectively put in practice and engage on these training and certification.

So this is a concept. It's a project that has just started, so it's early to tell you if it worked or it didn't work. We have great hopes on it and a few years down the line we'll be telling you about what we are finding. Let me just give you a few take home messages from my presentation. First of all, raw milk and raw milk markets are important. As messy and as complicated as they can be, they are important for many aspects: nutrition, livelihood, health. We cannot just look at food safety in isolation, and we cannot just think that any food safety strategies that have worked somewhere will work anywhere else.

We have to look and manage the problems in a context and specific approach, and we have to try and – often it's better to work with the source of the problem rather than suppress it, 'cause that can have very unintended consequences. So let's look at it from a holistic approach, finding _____ approaches that can help nutrition, help health, and help public health. So that's the end of my presentation and I'd like to move on to our next speaker, that is Dennis. I hope Dennis is there. Dennis, over to you.

Jennifer Lane:

Dennis, we're really sad that we can't get you. We're gonna try to get you on the line still. I think the network in Rwanda today is not going well. So Dennis going to present about the recently closed USAID funded Rwanda Dairy Competitive –

Dennis Karamuzi:

Hello, can you hear me?

Jennifer Lane:

Yes. Please go ahead.

Dennis Karamuzi:

Hi, how are you? My name is Dennis as I just got introduced. Very sorry I'm having Internet problems here, but I hope that we'll be able to make progress. As they probably already introduced, I am presenting a case of Rwanda in which we have employed a multi-pronged approach to cleaning up the milk supply chain.

I should say I'm privileged to speak after both Hung in Vietnam and Silvia in Nairobi 'cause a lot of what they provided as background gives a good starting point. Going forward, this is a program that has been implemented by Land O' Lakes with funding from USAID. Over the last five years we have had the privilege of growing the _____ sector and cumulatively it makes a ten-year investment that Land O' Lakes in collaboration with USAID has made here in Rwanda.

A bit of recognition to all of our partners, Africa Breeder Services, _____ Cattle Management out of Nairobi, Inspired International who did our financial _____ products, and University of California Davis. We have been privileged to work with a very committed team. Going forward this project has a very ambitious goal as you will see, and our goal is that _____ Dairy products can be made competitive in regional markets. Rwanda is located in the heart of Africa and being right there there's a lot around in the neighborhood that could easily throw out of balance. So our goal was ambitious as the pressure around that.

But again as a project we were privileged so far within a good timing, a timing around which the government was developing the national data strategy, and set an equally ambitious goal which saves the competitive dairy sector providing quality dairy products which are affordable, available, and accessible to all Rwandans and other consumers in the region. So you can see clearly that the national goal was to actually give priority to the local citizens and gradually a _____ in turn to the neighboring communities. So we started off from that point.

As Land O' Lakes and the implementing partners, we set out to understand the structure of the dairy value chain here in Rwanda, and as you can see from that simple graphic presentation, this is a major small holder country, and that tells you that a lot of the success comes from a profile or an efficient aggregation _____ _____ and the delivery to the market kind of purpose. So we combined several forces as you will see in the diagram, and it combines what we call both the push, which is the effects around improving production, which includes input support, proper seeding,

breeding, _____ heart, training around the farmers and the aggregators, keeping if you like the basic _____ _____ _____ milk qualities.

All of that helps to aggregate good production around what we call milk collection center, and then gradually send it to the market. As you see the structure of the markets we had the combination of large dairy processors, not that large, in the range of maximum up to 150,000 liters a day, and then we have raw milk vendors or raw milk traders if you like. These make the bulk of what drives the market here.

Over 75 percent is driven by this informal market, and then we have the quarterly processors, which are really small and could go up to a maximum, say, 1,000 liters per day, and those would not be more than, say, six if you look at the entire country. So looking at the demand, which is the pooling effect in the market, we have worked strongly to ensure that both our support on the push which is at the production end all through to aggregation is combined with an equally efficient pool.

The pool combines several things: price-based incentives that people would be motivated to aggregate milk through this approved process, and approved I say because this is the one way that you can only guarantee that you track all the volumes as they come through. So what the project has focused on is going right from the primary producer to the milk collection center, we have up to now about 96 milk collection centers across the country, and we have been working in _____ districts. So we've had the privilege of handling the bulk of them, 76 milk collection centers. These are efficiently used to supply those different points.

So up to this point I could say like I had from the Nairobi case, our market is as I said heavily driven by the informal sector, and that doesn't mean that anybody will even be interested to close down any of them. So our priority has been cleaning up across the entire chain from the farm, the small producer, all the way to the markets, and that provides a level ground for everybody to source clean milk, and that's what we call the market _____ approach. We aim to clean up the milk for everybody all the way up to the end of the chain. So we have combined a lot of the incentives as you saw in the push/pull diagram.

We have combined it with an enabling environment around the policy. So we have worked with the government to put in place what I said the national data strategy, which provided a good basis, a good starting ground. We have worked on a national _____ control strategy with the University of California Davis. We have combined that with some guidelines around what we call a _____ order with some packaging policy that helps to

determine or rather to associate with the real problem that we have in this country, plastic is banned.

That is all of the effort must be put into initiatives that can promote _____ without _____ packaging in plastic. We have initiated what we call _____ working groups, which help to advance the problem, whatever it is, and then we have worked with the private sector _____ to establish what we call the one-dimensional data platform. Now this is a platform that will continue beyond the project life. And then from the push end we have supported a very strong consumption campaign which blends very well with the ongoing efforts around improving milk consumption in schools.

Now going back just quickly, the real problem has been the lack of enforcement. We have all these guidelines in different directions, but the proper enforcement guided by some proper documentation of what the issue is has been a problem. Incentives from the pull end that help people actually improve their quality. Infrastructure around the coal chain has been mainly limited, and then traditional consumer preferences, people here don't necessarily bring from the supermarket. Many bring from the farm. So we aim to clean up the milk from the farm so that as we encounter the different buyers it is clean all the way.

Then knowing the limited processing capacity as I told you earlier, this remains a challenge, but we were well aware and work towards cleaning up the milk so that at whichever point you will meet the milk, it should be a clean product at that point. And then of course issues around infrastructure, but I will not take a lot of time. So our priority has been focused on cleaning up the milk right from the primary producer at the aggregation as you can see in this little picture demonstrates some of the milk collection points, testing the milk _____.

At that point before they reject or approve they will have tested the quality of that. So we have distributed the _____ all the way. And so what we combine is both the software which is the knowledge from the training, and then the hardware which is a mix of the _____ and the actual equipment, the bulk collection equipment. So in effect we have started what we call the seed of quality. It started more as a concept of what we can achieve together, aiming at distribution of quality testing kits all along the data chain. And so we have worked to improve transport logistics, advocating for certification through what we call the Rwanda Agriculture And Livestock Inspection _____.

We have trained cheese makers, and as you know many of _____ cheese is usually in our case, it's usually made in many of those places that are not able to access the market. So those are the primary targets to ensure that they understand the basics of quality because their product is likely to be out there in the market if it did not receive attention. So we have worked a great deal on improving the product around those cheese as it comes out to the market, all the way from processing or cheese making to branding and marketing.

As you see in the little demo, they demonstrate the little aggregation points as we bring the milk together, the different testing kind of tools that could be brought into play and the measure of that is what the project has supported to provide the hardware, but in addition compliment that with the proper training that has been provided. So what you see in the next picture is a gentleman at the milk collection center properly dressed, properly _____, and those are considered _____ _____ _____ milk collector.

So across the board we have achieved less milk being rejected to the point of almost zero for many collection centers that have enrolled, and we have also in a way using this army of milk collectors, well-trained guys, they also act as the people. They are more or less the gatekeepers and they are responsible for inspecting quality and gradually helping everybody across the board. So this is at the milk collection center level where the traders or the transporters deliver their milk. It is sealed, it is tested, it is received into a _____ tanker before a transporter can come out and pick it out.

So we have combined as I say software and hardware, and as you can see in this picture you see that this is from a traditional cooking stove where they are boiling milk to batch pasteurize the system which we have promoted across the different what I call _____ _____ processing points. At the milk collection center we have promoted more bulk holding, but they can link up with traders more efficiently. So we have improved the processing capacity. We have improved the holding capacity.

Now going to the _____ market _____ _____ we have worked with the largest processor who I earlier said, and we have tried to be aggressive, understanding the traditional preferences for bulk for people buying 5 liters plus, _____ being panned as plastic. So what we have worked with the process _____ _____ milk _____ which is a retail center where you sell milk and people bring their tanks and bring their _____ to just empty into their tanks.

So what we have promoted includes both the practice itself, understanding that this is fresh pasteurized milk, not un-boiled milk or uncooked milk, and then if you deliver it right where you want it. So over the life of the project we have achieved from zero _____ in milk collection centers or rather milk zones, which are points of pasteurized milk, we have grown to over 85 in a period of less than three years. It concludes a proper packaging of the franchise mechanism where traders graduate from an informal trade business and enroll on this more profitable business and that's very well for them.

Going towards the end, I think that emphasizes more the point around the milk collection centers and the milk zones from the _____ consumer. Now I wanted to talk briefly about the _____. We have promoted the national campaign, which generally promote milk as a good high quality product in terms of nutrition. So it combines the knowledge of nutrition across the board.

I wanted to move forward to one cup per child program, which is the program that has been supported by the program. The fact that you can hear me, I hope I'm not exceeding the time. I lost a bit of connection at some point. So we have complimented the consumption program with what the government has been driving as one cup per child program, which is an aim to improve the nutrition across the board _____ to the younger ones in school.

Now the multi-pronged approach as I told you earlier, it brings together a lot of effort around the milk collection trade and what we have put in place is a seed of quality, and combine that properly with the behavior change communication campaign that helps everybody to graduate from a low quality limited supply kind of product to a much more stable supply higher quality product, and that helps to provide a clean _____ affordable and available product for all.

Going forward, key takeaways from my presentation, hopefully keeping within the time. We have worked to increase access to affordable nutritious cleaner milk across the board, and then it is important as we have a _____ to maintain a good relationship between the push/pull kind of issues where the real motivation is actually in the market. The market is what is _____. The push is all of the forces that are happening with the farm.

Now with the farm I think on farm testing helps extend the level of accountability across the board and helps everybody participating in this chain to be much more accountable. We have also understood that incentives, especially based on price, are very important. In our case all of

the effort we have put into play could not be even better if we did not achieve a government endorsement of _____ the work through an enactment of the national policy that is currently guiding this entire process.

And then we have also determined that depending on the cultural preferences, milk sales are determined by _____ and demand. So in our case, a case of seven milk _____ has been very instrumental in transforming the culture of consumption. I also want to mention the collaboration between the processors and the milk collection center and the nationwide milk consumption campaign that contributed largely to put into play all of the forces that applied to clean up the milk trade.

So in brief, all of these points have been _____ together into play in the implementation of the program in addition to a wide range of other kind of important aspects of the program. So going back a little, I probably spent a lot more time talking about the program around quality, but I wanted to also let you know the program has extended beyond quality. We have talked about policy that you have, we have talked about business development around the milk collection centers, we have been a strong force around enforcing quality and we have generally talked about consumption. And so combining all of those could not be better without the implementation of a cleaner milk for all kind of approach.

So I believe I have tackled most of it and I would like to thank you very much for being very patient with me. I lost a lot of the connection, but I trust that you have been able to follow, and I'll stay online for any questions. Thank you and over to the host.

Jennifer Lane:

Thank you so much, Dennis and to all of our presenters. This is Jennie again from Land O' Lakes. We're gonna go now into the question and answer session. There's been an incredibly rich discussion and questions going on in the chat box, so thank you to everybody. We don't have a lot of time so we won't be able to get to everyone, however hopefully there's maybe an option that we'll be able to have kind of an online chat on another date that Agrilinks may also be able to host on this topic and our speakers might be able to respond with some written responses to some of our questions as we group them.

I do want to before we go to the questions just flag. There's been a few questions regarding mycotoxins and aflatoxins. As Andrew mentioned earlier, Agrilinks has had multiple webinars and there are a lot of resources on aflatoxins and mycotoxins in not just animal sourced foods but all sorts of crops. That is outside of the scope of this talk. We do know with very

good science from the World Health Organization that the global burden of disease of foodborne illness in animal sourced foods is primarily from bacterial and parasitic infections, so that's why we chose to focus on the management strategies, those issues, in these talks.

I encourage you to look at Agrilinks for resources for mycotoxins and aflatoxins going forward. Our first question that we're gonna go to is for Hung and he is gonna ask him to speak to the data collection and how you address the issue of lack of data, for instance is this maybe a reason why there's limited antibiotics in food of origin? Is that a data problem or is it because you know there's data there and it's just not kind of coming out in what you've found? So back to you, Hung.

Hung Nguyen-Viet:

Good evening again from Hanoi. This is Hung speaking. Thank you very much for the interest and the question. I can see here some concern from colleagues about the data, a lack of data in real assessment _____. As I mentioned from the beginning, risk assessment is not new to _____ not in terms of implementation, application of risk assessment for food safety has been rather recent for Vietnam. In this type of context we need to really adapt to the local context but also to develop kind of a new approach to conduct this assessment.

So coming back now to the lack of data, for example we look for the data of meat consumption for example and specifically for pork in Vietnam. You don't really have _____ for pork specifically. You have meat consumption for every type of meat included. So in this _____ things either we conduct it ourself away from the study side, by for example you see convening focus group discussions to really involve partners and stakeholders of value chain to provide information for our _____ model for that.

The second question is about the low level of antibiotics _____ in pork in Vietnam. That is actually _____ themselves from our study. So I think we need to make this clear, in fact the _____ of AMR, anti-microbiotic resistance is quite important in increasing in developing countries including Vietnam, and that actually we didn't – that in the _____ study, however the antibiotic resistance seemed to be quite low in our surveys, and I think that one of the reasons for this low level of antibiotics _____ in fact maybe the livestock sector can get _____ from that side, but also the vet _____ point of view withholding a period for antibiotic treatment is quite nicely kept for this area of study in _____ two provinces north and center of Vietnam. Over to you. Jennie.

Jennifer Lane:

Super. Thank you very much for that. Okay, the next question is for Silvia. Silvia, we have a listener inquiring about milk certification and if customers were willing to pay a higher price, and how much did that price increase? Kind of trying to get to the question of balance between affordability of the product and product quality.

Silvia Alonso:

Thank you, Jennie. So yeah, that's a very relevant question. When the training and certification was implemented ten years ago, the beginning actually the _____ just laid into an increasing price. The price of informal sector is very, very determined by the market. It's a very competitive market. There's so many retailers and traders selling raw milk that obviously a trader that might go through a training cannot allow himself to just increase the price. So this is not _____ that.

What if people would be willing to pay a premium in terms of higher price for better quality milk? I do believe that in the long-term they may. Obviously you saw the _____ capacity of the customers, which in certain contexts is very low, but I mean from our talks to traders they seem to report that their customers were clearly happier with the quality of the milk that the traders were selling. The traders were very happy with that. They could see that the customers were coming to them.

So while it might not be immediate, a customer might not be just waiting to be _____ after the trade straightaway, they may all the time when they get used to that higher quality and they learn to sort of appreciate it in the long term, that might result in customers to be willing to pay smaller, very small amounts of higher price for that better quality of raw milk. That is something we actually did _____ . So yeah, so to me that is the key. I'm not sure the second part of the question, Jennie, you can repeat it, or was that answering what the question was?

Jennifer Lane:

I think you captured most of it. We can go on to Dennis. Thank you, Silvia. So for Dennis there was multiple questions regarding incentives for producers to bring their milk to the collection centers rather than going through more informal channels, and what are the benefits for people that are participating in the milk collection centers? In that same vein there was also a question regarding kind of these milk collection centers and how they're financed as standalone business entities or where they get their funding from if they were part of the project or if they're gonna continue on after the project. Over to you, Dennis.

Dennis Karamuzi:

Yeah. Thank you very much, Jennie, and a very good question at that. Of course this whole structuring of the data business has happened in the midst of a chaotic kind of environment where the whole country is only trying to

rebuke across different sectors. So over the years government has invested quite largely in two different mechanisms and established what we call the milk collection center, and they have struggled quite frankly with the actual functionality of the MCC because the ownership is at this point with the milk cooperative. So what you have seen I would like to go back to that slide, the structures, the market. What you have seen as I navigate back, I don't know if the host is holding anything.

What you have seen is a mechanism that has been structured to be able to target incentives at different points. All the way from the producer as you saw that quite clearly, helping the producer to understand the needs for their business to be able to improve, to be able to grow. So over the time of the project what we have focused on has been mainly trying to package around the entire chain. If you are a producer you have received training, you have received the package of input, you have received the proper extension care, and you feel obliged and connected to your cooperative which is facilitating the provision of _____.

So what happens is the services around the milk collection center become the motivation for farmers, for producers to be able to enroll and supply their milk through this point. So it has been essential in our BBS training to emphasize service provision to the farmers because that is the second point. But on the other end too, the informal market, which is the traders around the different collection points that will usually cause people to buy _____ the milk collection centers, they are poorly regulated. They are not properly listed as business entities and farmers always risk losing all of their produce.

Over the years they have seen the difference between working in a structured market through a cooperative, through a recognized trader, and across the chain on the other end proper supply to a buyer who can guarantee payment. In addition what we have done is to structure finance within this _____ chain. So a transporter who has a steady relationship with a cooperative is able to _____ funding from the bank or a grant from the project, or even a long-term kind of contract with a milk buyer to be able to supply this milk gradually over a long period of time.

So all of those incentives combine to help the farmer to see, to kind of _____ to actually formalize if you like. So what we call it is really more graduated formalized milk trade by providing incentives that don't necessarily – well they _____ sense, but nobody _____ to get into this chain. In simple terms, the real motivation is a combination of pricing from the pool end, a combination of service provision, improved BDS services around the milk collection centers.

That's a very important aspect. If there is an enterprising proposition to the other end, to the farmers, the farmers will gradually go away and end up with a trader who pays cash. Now the last and most important I think has been the structure in _____ around this same value chain. So while you are achieving equality across the board, you're also achieving a lot of value addition to this entire business at different points. The _____ is able to acquire funding to grow their budgets. They are also able to pay back in time to the supplier.

The supplier is able to pay back to the contracted milk collection center and so on and so forth. So there is a combination of forces to make the incentives across the chain, but as a project our soft contribution _____ in the training, in the mentorship that provide both the cooperatives and the individual producers around _____ to appreciate the long-term value in actual _____ structure. I think that's the most important that I needed to say. Thank you. Over to you, Jennie.

Jennifer Lane:

Thank you very much, Dennis. Okay, we're gonna go to a few more questions, but in the meantime we're gonna pull up the polls for your voting on how this webinar went. The webinar is not over. We're gonna keep on answering questions, but please answer those polls while you continue to listen. The last question is going back over to Vietnam and Hung. Is there anything that you could share about your experiences from working with the informal pork sector to mitigate the food safety issues since the order and command approach did not work, and was it because of ineffective enforcement of food safety laws and regulations?

Hung Nguyen-Viet:

Thank you very much for this very interesting question. I have to say that our Indian partner has been working a lot on assessment phase, so you can see some of the evidence in this assessment on how _____ pork, fish _____. We are moving now to a new phase of introducing innovative interventions to _____ improve food safety in general in Vietnam, and that is actually part of the upcoming project _____ pork, so-called _____ pork, moving from pretreat as I showed to the new project _____ here.

By working with informal pork sector in Vietnam in particular and as a country I would say that _____ has the kind of experiences in this informal market in Africa and in Southeast Asia. I think the evidence shows a great issue of food safety in Vietnam now is really the _____ communication issue in the country. I mean consumers don't perceive very correctly the risks that they would have from consuming the foods they buy.

We have also kind of flowing up by the media about the risks coming from food systems. So I think we need to work more on that risk communication and improving the task of consumer to _____ food. Some of the studies showing that formalizing markets like central markets leads to a very essential food in some of the markets, and from traditional way. Like Silvia said, we need to really have people to improve the food safety standards in _____ for the market. For example, showing that the _____ and branding came from the _____ house to the market to make people aware that food is safer, but they need also to pay premium to get safer food.

In some cases you bring the safer food and that mixes with the less hygienic food or meat, so that _____ problems. It creates _____ an intervention to _____ measure for that needs to be promoted more and more. Finally, you are very right. You say that the reinforcement of regulation is quite weak in developing countries. For example, if you compare the human resource of food inspector of the whole country in Vietnam for example if you go into the number of food inspector of Bangkok City in Thailand.

So you see some drawbacks and weakness in the system. So that's why I think we need to really approach this thing from both ways. In the long-term point of way I think the reinforcement of regulation is particularly important for development in future, but in the meanwhile we need really to find those solutions like our speakers talked about in the context of Africa or here in Vietnam really to help people to improve the food safety. I hope that I can give some element to answer the question. Over to you, Jennie.

Jennifer Lane:

Thank you very much for that. Okay, we're gonna work on wrapping up, but Dennis has something to add from Rwanda, so we're gonna pass it over to him.

Dennis Karamuzi:

Thank you very much, Jennie. An important aspect I wanted to make sure to bring up is the restructuring of the market and cleaning up the note has been strongly complimented with the program, national family production kind of education process, which I think is something that Silvia talked about, and in fact it is adopted from some of the idea work that we have done in Nairobi and we adopted it for Rwanda in the way that these new collection centers that are participating in the cleanup process are recognized first of all through the different incentives that I talked about, but also strongly through a national certification by the Ministry of Agriculture, which we call the Rwanda Agriculture and Livestock Inspection Party.

So we have worked with the government, with the department, to develop criteria for evaluation of these new collection centers, and they are heavily packaged around the different aspects of milk quality, right from the value _____ from conception through into the business itself and how _____ _____ to given, the kind of value they provide back to the farmers, and all of that comes together to provide what we call a seed of quality certificate. So combine the set of best practices across the board that are all aimed at improving the quality of the milk and also the quality of the business at the milk collection center.

And as we concluded the program at the end of December we were privileged to commence the first certification event of 27 dairy businesses out of a network of about 77 milk collection centers that we worked with. We have 27 of them award the national certificates, and these will last up to a year, the license, but we allow them to operate and an advantage over the other for trading in a product that is already guaranteed of high quality.

And an ongoing compliance check will happen at different points during the year, and that for us has been a major success in the sense that it has _____ the primary producers to be able to trade, because in any case they were trading, but in this case to be able to trade higher quality, higher value kind of product. We wanted to be sure that we can allude to the fact that Silvia _____ something around training and education, in this case from dairy business. Thank you. Over to you back again.

Jennifer Lane:

Thank you, Dennis. I think that's an important thing that you had to add. Okay, everybody, that's it for questions. I think I'd like to thank the speakers again and Agrilinks. This has been a really valuable webinar. I think that the listeners have probably heard some really good examples from diverse fields and regions on how both the informal and the formal sectors can play a role in this, and we need to find a balance working all along the value chain.

In watching the chat box there's also been kind of discussion about behavior change communications and linking this to actually improve consumption of animal source foods to improve nutrition in the most vulnerable populations. We're on the edge of some cool new work and I hope that we can continue to lead some conversations around this with other partners both here in the United States and around the world. Thank you very much to everybody. All of the resources are available. I'm gonna pass this over to Carla to wrap up.

Carla F. de Castro:

On behalf of USAID's Bureau for Food Security I would like to thank all of our participants for a really engaging chat today as well as all of our speakers: Silvia, Dennis, Hung, Jennie, and Andrew. Thanks to all.

[End of Audio]