



COMMERCIALIZATION OPPORTUNITIES FOR ORANGE FLESHED SWEET POTATO: KENYA, MALAWI AND SOUTH AFRICA

PRESENTATION TRANSCRIPT

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Aviva Kutnick:

Hello everyone. On behalf of Agrilinks and Feed the Future, I would like to welcome you to our Feed the Future webinar on commercialization opportunities for orange flesh sweet potato in three countries in Africa, Kenya, Malawi and South Africa. My name is Aviva Kutnick and I am with the USAID Bureau for Food Security and I'll be your webinar facilitator today. So you'll hear my voice periodically especially during the question and answer session.

More than 800 people across the world go to bed hungry each night. As the global population grows so do the opportunities and challenges associated with ending global hunger. Feed the Future, the US government's global, hunger and food security initiative is working to combat global hunger through partnership and innovation. One of those innovations is orange flesh sweet potato also known by the acronym OFSP.

Before we dive into the content of this webinar, I'd like to go over a few items to orient you. First, please do use the chat box to introduce yourself and let us know where you're joining from. We have many participants today from around the globe. Welcome to everyone. The chat box is your main way to communicate and participate throughout the webinar and we encourage you to use it to post questions, share resources and discuss the topic with your colleagues. We have several guest experts in the chat box today, Simone Heck and Tiwanda from the International Potato Center based in Nairobi, Kenya. Welcome Simone and Tiwanda.

Simone and Tiwanda and many others from the International Potato Center also known by the acronym CIP were key partners and informants during this study. They work on a continual basis with development partners, governments, scientists, growers and processors around the world to advance orange flesh sweet potato varieties, seed systems and market dissemination. Simone and Tiwanda will be in the chat box throughout the webinar to prompt interesting questions and to provide answers on your technical questions on OSFP. We'll also be collecting your questions throughout the webinar and we'll answer some of them along the way and the rest we'll hold until after the presentation question and answer period.

You'll see that the slides are available for download in the box on the left of your screen as well as some other resources we'll be talking about today. Otherwise we'll be advancing the slides as we move along the webinar. Lastly on logistics we are recording this webinar and we'll email you the recording, transcript and additional resources once they're ready. They'll be posted on the Agrilinks event page and we encourage you to share them widely.

Ok. Let's get started. So again, I'm Aviva Kutnick with the USAID Bureau for Food Security and I work in our private sector engagement office and I'm your facilitator today. Our other two main presenters are CJ Fonzi from Dalberg. And CJ is based in Kigali, Rwanda and you can see his bio on the screen. His range of expertise is broad including impact investing, agriculture and SME finance and support. Carlijn Nouwen also from Dalberg is our second primary presenter today. She's based on Johannesburg, South Africa and she leads the inclusive business expertise area and co-leads inclusive industrialization work and works to promote investment throughout Africa. Wonderful.

So let's get started with a few more items of introduction. I'm going to review a few points on why orange flesh sweet potatoes and why USAID undertook this study on commercialization opportunities. As many of you know, orange flesh sweet potato is sometimes referred as OSFP and was developed by International Potato Center researchers and scientists to biofortified varieties of sweet potato with beta-carotene that produces vitamin A in the body. This is critical to food security as vitamin A deficiency particularly among expecting mothers and children under five can lead to compromised immune systems, blindness and is associated with stunted growth. Just half a cup of boiled or mashed sweet potatoes fortified can meet the daily intake needs of a child under five years of age.

These biofortified varieties are sweeter, easy to grow and more nutritious. Sweet potatoes are widely consumed across Africa and these root tubers are especially important related to risks and resilience. During periods of drought maize and other staple harvest crops are threatened, often sweet potatoes will continue to grow and sustain communities. They are known as resilient crops and along with other tubers sometimes as famine food.

Over a decade of USAID support for OFSP at USAID has led to some critical questions about how this so-called miracle food can scale and expand into food systems generally. So we wanted to undertake this study of commercialization opportunities to better understand the donor and public sector roles and potential private sector investment to catalyze those crops into food systems on a sustainable basis. And one way we wanted to do so was to examine the possibilities of food processing for orange flesh sweet potato.

Taking a look, orange flesh sweet potato we'll be focusing on just three countries today, Kenya, Malawi and South Africa. But this slide provides an overview that the orange flesh sweet potato is available at different stages in many countries throughout Africa. While we'll be talking about orange flesh sweet potato today, looking at commercialization opportunities broadly is something that USAID has undertaken. USAID has a new policy on private sector engagement where there's a mandate for USAID staff and partners to ask critical questions every time we approach a development or humanitarian issue.

This is based on three questions. One, asking ourselves could there be a market-based approach to addressing this issue. Two, what are the roles and interest of the private sector in addressing this issue. And three, are there factors constraining the private sector from involvement in investment. We understand that development dollars and public sector resources cannot do this alone and that in Africa there's more and more commercial investment that will really catalyze changes and positive growth in the food security space.

Finally, I want to talk just a moment about USAID's investment support program which is the project that this study was undertaken under. So the program works in six areas and today we're going to be looking primarily at number one which is investment identification and promotion. Ok. Now we're ready to switch over to Carlijn for the bulk of the presentation.

Carlijn Nouwen:

Thank you so much Aviva and it's a real pleasure to be with all of you today and thank you so much for joining and thank you for that great introduction to the importance and relevance of orange flesh sweet potato which means that I actually if I can operate these slides here, going to skip this first slide which outlines the

benefits for farmers, for consumers and for the food industry which Aviva has done a great job of doing it. And I'm going to start with a little bit of a cold shower which was our task on this particular engagement.

The focus for our work and the focus for today is on investment facilitation, not on food security, not on crop fortification but on the ability to engage private sector money to take this to scale. And that requires you to take a slightly different lens from what you might be used to normally. So we wanted to take you through that so that you can put the right glasses on for the conversation today.

So firstly, there we go. So as Aviva already showed in the slide earlier the uptick in growth of orange flesh sweet potato has been very impressive quite unlike any other crop. And many of – much of the praise of that should go to sectors who work tirelessly with partners across the continent to actually introduce this crop and get farmers to grow it and consumers to consume it.

So given that, the natural next step is to then look at what are large scale commercial plays as we want this. You really want to draw in private sector investors that can then generate a bigger demand which creates a pull for more farmers to row OFSP for a bigger part of their plots with higher yields, better incomes, better food security, etcetera. The ISP program that Aviva spoke about focuses on investment facilitation. And the nature of the investment pulls for opportunities for larger small medium enterprises and up. So this is not about micro opportunities. This is not about a few farmers that can use the harvest of OFSP to bake cookies and sell on their local market because that won't draw in the investment funding that this project offers to look at.

That doesn't mean that there's no potential and viability for that kind of innovation and that there's no opportunity for life improvement for people involved in that kind of work. It just was not the asked for piece of work for us today. To explain those kind of investment opportunities, the ISP team focused on three things, demand, a viable business case for process of OFSP and a viable business case for farmers. Obviously for this to have commercial and development impact those processors that are the main investors in this space should see a case to move in.

But it should also continue to make sense for farmers from a livelihood perspective. So we also continue to look at what the revenues per hectare will be when farmers grow OFSP and how that compares to other crops that they could grow. This approach very much links to the three questions that Aviva earlier outlines within your private sector engagement approach that USAID is using.

Today we invite you to put on the hat of an investor who is expecting a return on investment with an acceptable rate. And that is not an easy task for us at this element professionally. We often forget the commercial risk. And we see the opportunity but we don't necessarily see the risk that it can go wrong. And we don't take into account that to be able to accept such a risk investors accept or expect a higher return on their investment. How can we test? And specifically do what we call the savings litmus test. When you hear about these opportunities think for yourself how would I feel if my pension savings were invested in this space? Would I be comfortable? Would I be excited? Or would I actually feel a bit jittery because this doesn't quite feel really sustainable? That's a nice test to take today because that is the kind of questions that investors are going to ask when we invite them to join these kind of opportunities and these markets.

Of course, we couldn't only be tough so we also identified opportunities that are less commercially viable and knowing that they may only align with the objectives of impact resident and growth buyers. And so, as we go through the answer, the findings on a country by country basis, my colleague CJ will point out some of them. But that distinction has been one that has been very important in our work.

So with that context setting, let me take you through the definition of two concepts that we use continuously throughout this work. One is a business opportunity and the other is commercial scale investment. A business opportunity that you see on the left-hand side, very well helped by this green arrow that's popping up on our screen, reflects an opportunity to assess a market and operate profitably. So it answers the question can a business be run. That can be a very small-scale business so think again about that example I gave earlier about a couple of farmers boiling the OFSP maybe on their farm and baking it into products that they sell on the local market. If they make money out of that, great. That's a business opportunity. It can be small. It can be local. It can be niche. It doesn't have to drive scale.

It was not what we were asked to look at. What we were asked to look at was what you see on the right-hand side which is a commercial scale investment which is an opportunity that those operate profitably as a business opportunity but can also generate scale that is large enough or can generate large enough free cash flows to cover the cost of getting involved. So it has a positive answer to the question is it worth investing into. Because it does take time and effort for investors to unlock capital, to look at opportunities, to consider them, to get engaged, to get knowledgeable about a topic, about the area. And all of that is only worse if it takes not just a minimum return but also a minimum size for them to come to the table. So that was really the filter with which we looked at the opportunities that we ____.

Now as you see on this slide which is a very busy and wordy slide and I won't go through the details but you can download the presentation and look at it later. But I'm also sure that many of you on the call know this information. OFSP can be used in many different ways. There's obviously the fresh use where you use the roots in raw, boiled, baked or steamed food.

But the focus for our work was mainly, mostly on the processed use simply because that's where most of the investment opportunity materializes. And there's basically two categories in processes use. One is where it's still recognizable as sweet potato. So it can be potato puree, baby food, sweet potato crisps, some other baked goods. And then there's opportunities where it's not necessarily visible and recognizable as sweet potato. That's in some of the baked goods. It really depends on how much of the wheat you replace by sweet potato to be able to determine whether it's sort of invisible or not. But you can only also use it as a starch in yogurt for example which is a very invisible use of the sweet potato.

And then there's some opportunities for nonhuman consumption particularly on animal feed where it's mostly in the leaf rather than the root. The roots can also be fed to animals but that's usually not the strongest business case. And it has in some cases been identified as an opportunity for input for biofuels. So those are the kind of uses that you can think about when you think processed OFSP and investment opportunities.

Then we asked ourselves how can you grow these processing volumes because they're currently quite low. Most OFSP that is grown in these countries is consumed fresh. And to be able to create the demand for that processing you have to think about what drives the growth of processing volume. And there's really three ways and only three ways and we had to continue looking at those in all of the countries. The first is with that visible use of product if buyers and consumers change their habit and their behavior in favor of products that contain OFSP in a noticeable way. So either retail consumers start buying OFSP like bread that has a certain degree of OFSP in it or OFSP chips instead of regular potato chips. Or institutional buyers start using OFSP and OFSP products.

And when we say institutional buyers you can think about schools, school programs, prison systems, military feeds. Like the big buyers that buy food at the very large scale. The challenge with that as a way to grow the use of orange flesh sweet potato is that this requires a change in behavior and as many of us on this call know, changing people's behavior is very difficult and takes a lot more than telling people it's good for them to change their behavior. We all know our diets, our ideal diets would look quite different from what we're currently consuming. Probably our ideal exercise routine would be different from what we're currently doing and just telling us over and over again doesn't change our behavior. And so, this actually relies on people changing their individual buying behavior which is no small feat.

So therefore, the second research are actually more interesting opportunities to look at. The second is producers switching to using OFSP in invisible application so as a starch in yogurt for example. And that doesn't require any behavior change from the buyers, from the ultimate consumers. So that's not concern of the producers in that case and all that you need to be able to show is that is it actually worth it to them whether it be cost saving or something else that they can benefit from. But the more it's invisible, the more it's probably cost saving and processing ease and that will win them over.

The third category is to get producers who already work with OFSP to include OFSP from Malawi, Kenya or South Africa. And this requires actually no change in the product composition but it requires buyers to say hey, I could buy these products from these three countries rather than from any other countries that they come from. What that obviously requires is an international competitiveness. So

each of those have their own pros and cons and their own challenges in getting them right.

On this particular piece of work let me just go a few slides forward and then come back to the other ones. We looked particularly at OFSP as a partial replacement for wheat in bread. You can replace up to 50 percent of the wheat in bread by OFSP puree which has benefits in terms of a more secure supply chain so you're not – most countries actually import a lot of their wheat so they're very dependent upon foreign wheat supply and upon their exchange rate as well whereas if you can use locally grown OFSP you acquire more of an independence. It may in some cases, not always, yield a cost savings.

And it has some benefits to the product. It does change the product. It changes the texture. It makes it a bit softer. It makes it more shelf stable. In most cases, consumers have indicated that they prefer that. It changes the color. Some people describe it as gold. Other people describe it as orange. Whether or not people prefer that over the current look and feel of bread is obviously up to the consumer's preference. And in some of the things that we do you can see it.

Why did we look so carefully at bread and not at any of the – we looked at other opportunities as well but bread was really our starting point when we looked at specific opportunities. And that's mainly because a) wheat is so much of an imported unstable in many of these countries and 70 to 80 percent of the wheat goes into bread baking. So if you can actually find an alternative for as an ingredient into bread, that actually affects a big part of your wheat flows.

More importantly though, use of OFSP ingredients in other products tend to be either a much smaller ingredient or overall a much smaller market. So in bread, you can replace up to 50 percent of your wheat by OFSP. In many of the other products, either cookies or for example starch in yogurt, obviously not 50 percent of your yogurt volume in weight is starch. So you cannot absorb as much OFSP volume in those other products because it would just be a much smaller ingredient in the overall product. And therefore, by default the smaller market opportunity.

And then on top of that many of the other products that OFSP could go into are consumed in much lower volume than bread is. People eat less cookies than they eat bread. People eat less potato chips than they eat bread. So for all of those reasons, processing OFSP as a wheat replacement in bread is a great first opportunity to look into. It's also relatively technically simple compared to some of the other opportunities. And bread baking tends to be done in a relatively concentrated industry so you don't have to convince hundreds upon hundreds of smaller processors to start taking on this product. There's usually a few big bakers in a country that bake most of the processed bread. So if you can bring them along you can actually win quite a bit. I skipped over a few slides and I'll go back to them now.

As you see on this slide, typically the evolution of the use of OFSP is from subsistence to commercial business opportunities but not necessarily industrial scale to industrial scale. And if you look at the very different countries, not surprisingly Malawi mainly has subsistence use with some very early commercialization, financial use. Kenya is on track towards sort of more commercial use. And South Africa has a whole range from subsistence all the way to industrialization. So that's where the countries currently sit and we were looking predominantly again at investment opportunities on that industrial switch.

To be able to do so, we looked at three things per country and that will close my section and then CJ will look at the individual countries. First of all, we looked at the demand and the opportunity for OFSP processing. So taking all of this into I spoke about earlier where how can you grow demands by making people switch over or by producers using it in invisible products or by producers starting to use it from your countries. How big are those markets? How attractive would OFSP be compared to what people are currently either consuming or using in terms of ingredients? And what do processors on top of that think of barriers to uptake for OFSP?

This was an important part of the work that we did. We didn't just do a desk analysis of the cost of OFSP comparative. But we actually went out and spoke to producers and said what would it take for you to switch over. And not surprisingly there needs to be a pretty big advantage for processors to make a change to what they're currently doing because changing always takes an effort. It always comes with

a certain risk. So the advantage needs to be quite substantial. And if the advantage is too much and all processors will say no thank you. I won't take that risk.

Then the second thing we looked at was success factors for realizing identified opportunities. So if there is a business case for processing OFSP what would be required to realize that case? And what elements would need to be addressed to kick start and opportunity. And then thirdly, obviously, we came up for air, synthesized that into a true investment recommendation and seeing for the identified commercial scale investment opportunities what investment size would be needed and what other considerations should be made.

I don't know if it was by design but the three countries that we looked at were very, very different and were very different in – they're obviously different in their sort of stage of development structures, the economy, general wealth, how agriculture is organized. And all of that reflects in the opportunities that we find for OFSP. So very excited to take you through the specific countries which CJ will do. But we may need to pause for questions if there are any on the approach that we took.

Aviva Kutnick:

Great. Turning it over to CJ.

CJ Fonzi:

Excellent. Thank you, Aviva, for the great introduction and Carlijn for the great setup. I am going to move fairly quickly. We have a lot of content here on three countries and so apologies for moving somewhat quickly through these stories. But I'm moving fast so that I can save time for questions. So if you do have questions please do write them down so that we can discuss them. And I'm also told that the webinar will be available for download within a week. So if there's some slides you want to look at a bit more or poke into, they'll certainly be there and available for that.

So the story we're going to tell here is a bit of a goldilocks story and I think Carlijn alluded to that. I think there's – we're looking at some countries that may be a little too small or a little too early stage. One country in particular that was, that housed several opportunities actually for commercialization and OFSP and one country that was a little bit too big or too advanced for some of the work that we might do here.

And I'm going to start and actually spend a bit more time on Kenya than some of the other countries or the other two countries we looked at because we did see a number of opportunities with Kenya.

And in Kenya we saw I think two commercial investment opportunities. And I think we saw the opportunity for those to really increase farmer incomes and generate quite a bit of potential impact for producers. And so, thinking about producers we actually struggled quite a bit to pin down a farm gate price for OFSP. We saw numbers from FAO that were very high. We saw and very variable. We saw numbers from the ministry of agriculture in Kenya that were closer together but seemed much higher than what we'd even read in newspaper sources or talking to farmers about their experiences. As we talked to processors about what they pay for OFSP we saw that they were much lower actually than what some of the international sources had said.

And so, working with the folks and looking at some of the data and experiences that they've had as well as looking at the price that one current OFSP processor is paying, we used a fairly conservative price of \$140.00 USD per ton of OFSP in Kenya. And with this conservative price, I think we'll see on the left of this slide, we can still see a fairly substantial farmer income increase with an average yield if that farmer were to be producing orange flesh sweet potatoes rather than maize. And so, I think that this really helps to underline why in Kenya we would want to find the commercialization opportunity for OFSP.

Yes, there's some nutritious food impact which consumed by certain populations within the economy. But really big opportunity here to increase incomes and thus food security for some of the partners in Kenya. I will say that this increase in income comes with a big risk. Right?

I think and as we look at farmers, we look at their choice over and over again to grow things like maize instead of crops that we know can be at such a higher farm gate price, it really comes down to controlling their own destiny. And so, a farmer knows that if they grow maize they can dry that maize and they can feed that maize to their family throughout the year. Whether or not it's enough to nutritious is another question but they know they've got a basic necessity covered. Now as we ask

a farmer to switch to sweet potatoes, we're asking them to take a bit of risk because there's no sweet potatoes – they can't last all year.

And looking at the price variability they may not be fully convinced that they would fetch this price if they were to sell them. That's an important backdrop to have as we think about these opportunities. They need to be robust and they need to work because we're talking about the incomes of some of the poorest producers. Looking at Kenya, the demographic of Kenya, it really is a country that's got a rapidly growing middle class. The middle and upper classes in Kenya are still represent less than eight percent of the economy. But it's growing quite rapidly. Seven percent per annum.

And as we look at the consumption of processed food and as Carlijn pointed out the key opportunity we're seeing right now for processed per annum or commercial scale per annum investment is in processed food domestically. We're seeing – we see that it's really primarily the upper and middle classes that consume that. So that's an encouraging story for Kenya. We've got a growing upper and middle class. You may know that those are the classes that consume the majority of processed food and bread and baked goods.

But again, as Carlijn noted in the setup, probably not enough to switch to simply have people, have a market for it. We need to believe that that market will demand this product. We need to believe that there will be demand side advantages for a given product. And so, we looked briefly on the supply side whether there would be cost savings for bakers to switch to use OFSP or whether there would be some type of other advantages perhaps around price stability by switching 50 percent of their wheat to a different product.

On the demand side, advantages seem to be a potential benefit in taste and texture, although as we interview people for kind of both sides, some folks really like the orange bread with the textures. Others thought that it was a bit nontraditional. But certainly, there's a market for that. And increasingly health conscious class and as we see that upper and middle class grow, there may be reasons to believe that there is a health-conscious class.

And so, as we look at some more demographics around Kenya, we are seeing communicable disease on the decline, non-communicable disease on the incline. We're seeing people become more health conscious. We're seeing a number of healthy brands begin to be established and take hold in Nairobi and across Kenya. And so, there's reason to believe that consumers may begin to at least to some extent favor or not shy away from an orange flesh sweet potato product on its health merit. And further supporting that is the fact that the first real case, commercial case we've seen of OFSP bread is being sold by one of the large grocers in Kenya. And so that's a bit of a reason to believe that there's at least some demand. They're certainly selling some of this bread.

Now on the supply side, one of our hypotheses coming in was that OFSP could be cheaper. And if we actually look at it, you'll see on the charts here to the left, the current price of OFSP is actually more expensive than the, than making bread with purely wheat. It turns out that a bit of an anomaly at the moment. It's primary due to a historically low price of wheat in Kenya which by the way does not track against global trends. Global trends have been very consistent while there's been a bit of a price war on wheat production in Kenya. So we do believe that it is possible with innovation and if this trend were to come right, well, with innovation alone we believe it's possible for OFSP price to become less than that of the current wheat only price for bread production. And we believe that as this historic trend sort of stops and probably reverse is around wheat flour prices it's possible that OFSP could become much more inexpensive than using wheat to produce bread.

And on this slide, we've tried to show that bracket so we can see that for a long time, up until just a few years ago, it would have been much more expensive to produce bread using wheat flour vis a vis using OFSP puree. Then we see that that sort of crossed in the last two years. We see this period where actually the wheat flour price is cheaper. But given the two things that we've noted on the previous slide, we think that that's very temporary and likely to reverse and probably to reverse fairly significantly.

And so again, we see this dotted blue line. Investment in more cost effectively producing orange flesh sweet potato puree we believe could reduce the cost of making bread from that by a full 33 percent. So again, dropping OFSP bread down

to already being cheaper than bread made wholly with wheat flour. And then again as we see wheat flour prices come in line with global norms and the somewhat odd price trends of the last few years stabilize we think that that space between the cost of OFSP and wheat flour bread could continue to grow. So we were actually quite encouraged that that on the supply side in a mid to long term with a commercial scale we could actually see a cost savings in OFSP versus wheat flour.

And so, that led us to the question of how big could this market be. And so, this is a tough spot. It's tough to estimate how much market share one would get. And it depends on a few things. It depends on how distinguishable OFSP is in bread and in the different bread products that are offered. It depends on how receptive the market is to this new product. Again, we believe that there is a sub-segment of the market that would be very interested and attracted to this product on its health merits and perhaps another sub-segment that would be attracted on a case for flavor.

Certainly, given that it is more cost effective to produce, we believe that that would either incentivize producers of bakeries, producers of bread to push OFSP because their margins would be greater or to reduce the price of OFSP bread passing some of that savings along to customers and in the process spurring demand. So we've used an eight percent assumption of market share. That's ironically exactly what we received in the bakers. And we actually ran a bit of a research project where we went out and validated that that OFSP was selling and it was selling at about eight percent as claimed. And so, we thought that that actually represented a pretty good guess for what percent of the Kenyan market could be captured or the Kenyan bread market could be captured by OFSP bread.

And so, running a few numbers and understanding the implications of that, that could be about a \$5 million business today. Now to Carlijn's set up on what it takes for a commercial investment opportunity, \$5 million market is a big enough for one to envisage being able to make investments in fixed assets or investments in businesses that serve that market where one could cover their transaction cost and bring home a reasonable return. By a commercial investor's lens, it's still small but it is a sufficiently large market to justify some early commercial activity. And now remembering back to the growth of the middle class and the demographic shift that we're seeing in Kenya as well as the increased focus on health, we believe that this

market will grow over time and thus we believe that this investment is an easy commercial investment opportunity and perhaps an attractive one.

Now to understand the impact side of that, if we were to shift on eight percent of Kenyan's bread consumption to OFSP bread that would impact about 1,300 or almost 1,400 small hold farmers. And again, when we looked at the impact of almost tripling their incomes that's a fairly substantial impact. So in order to actually see and believe that this is possible, there's a range of market fundamentals that would have to be the case. And again, I think that we've sort of validated that none of them are not achievable although some of them in particular could be a little bit hard.

I think some of the technology innovations and keeping some of the bakers and bakeries to make this switch particularly at a time when it would be on its face look like a more expensive switch in the near term are achievable but are not the – will take some effort and will take some focus. So we did look at other opportunities around local consumption of OFSP in Kenya. Specifically, we looked at potato crisps, French fries, baby food and _ that were similar to these. And I think the story here was one of small markets and/or expensive production and heard both in the case of potato crisps. But what we found was in potato crisps because of actually the shape and size and texture of a sweet potato it would be more expensive due to excess waste and additional machinery use to create potato crisps and possibly a very small market.

With French fries, we found that actually it could be an interesting niche market. It's certainly a way to introduce some health into a product that's seeing a lot of market growth right now. But it's actually only in the very high-income segments of Kenyans that are doing French fires and a very, very tiny market at this point. We saw the same with baby food. Again, it's a very, very, very small market so even though it's a nutritious product and an opportunity, it's a long way from a commercial scale investment in Kenya right now.

Another interesting thing to look at is opportunities in export. And so, one of the things that struck us was that in Kenya there's a real opportunity to grow and export orange flesh sweet potatoes primarily to Europe although Belize could also be an

interesting target. And if we look at the chart on the bottom of this slide we see astronomical growth in the consumption of OFSP. I believe that these numbers are for the UK but we saw similar consumption across much of Europe. And so, we're seeing a real market demand there. And as we looked at some of the cost structures of producing and packaging and transporting OFSP from Kenya again a robust commercial port in Mombasa, it's actually quite an attractive margin, perhaps greater than 50 percent is possible. Importantly a couple of recent innovations have made this more possible and probably more profitable.

One has been the introduction of chilled shipping containers in the ports of Mombasa. This is something that surprisingly has only recently become fully possible on a smaller scale basis through rentals or shipping containers in Mombasa. And similarly, fumigation cost and techniques have evolved as well over the last few years and there's now reason to believe that one could viably fumigate and ship OFSP from Kenya to mainland Europe.

So similarly, we saw with processed food an opportunity to export to Europe as well. Using a baby food example, we were able to show that producing this baby food in Kenya which due to labor costs would obviously be less expensive than producing the food in the UK or Europe and shipping this to Europe could still provide a fairly hefty margin. Believe it or not, it would face a serious import tariff of almost a third. But the cost advantages are so strong that one would be able to ship that product still at almost a 50 percent margin. So also, a very interesting commercial investment opportunity. So I'm going to move fairly quickly through a few slides here. But we looked at what it would mean for someone to, for USAID to support investors to actually take advantage of these opportunities.

There's a range of production challenges around supply, aggregation, etcetera that are currently making it hard for processors to use OFSP. And then there's a range of things that USAID could do through windows like the ISP window to support investors and support these value chains to prepare them for investment. Similarly, there's a range of needs the processors have to prepare some of these investments. And there's ways that someone like USAID could step in to help prepare some of the processing markets for something like this OFSP opportunity.

And then finally my last slide on Kenya, we just wanted to say that what's interesting as we talked to potential uptakers or potential commercial actors in Kenya, they really aligned across three sort of groups. There were some are really interested in piloting the use of OFSP. There were others and I would say this was the bulk that we talked to that said we'd try that if you can help mitigate some of our risk early on and demonstrate for us that this can be effective. And then there were some folks that just were nonbelievers and sit to the side. But overall in Kenya, we felt that there was an opportunity to convince producers to take this on.

So I'm going to spend a bit of time on Malawi now. And as we noted, Malawi is a case of perhaps a bit too small. The opportunity for processors is pretty small. It's a nascent market and as we'll see one that may not justify commercial investment. Exports from Malawi is hard. Again, Malawi is a small, landlocked country that would have to go through countries that are also quite good OFSP producers like Tanzania to get through shipping port. However, we did continue to see some real opportunity for producers alongside health opportunities.

And so again, similar story to Kenya. In fact, even more dramatic in Malawi given the number of growing seasons. Malawi typically only have one. Shifting from maize to sweet potatoes could be a radical increase in farmer incomes. And so, the extent that we can find a way to move farmers into sweet potato production reliably, it could be very important for them around their incomes which can certainly lead to food security. Of course, the same risks apply to Kenya where if you move someone away from maize which can be dried and eaten all year, you do need to insure that the market linkages are there consistently so that that income increase can be realized and that money can be used to purchase food for a family, particularly in Malawi where you've got fewer growing seasons and so much more risk of a hunger season.

So there are sort of two key themes that we kept hearing in our interviews in Malawi. And one was processors saying it's tough to get ahold of good high-quality potatoes. I don't know if the supply is there. We saw this as very surmountable barrier. I think that a lot of the work that others have been doing is already taking hold and increasingly we're seeing supply getting better and better and better. The more concerning thing that we've heard from a range of the processors in Malawi was that the business case was a bit weak. They were convinced.

We were told by one producer there – and this is a story we’ve told many times – that they were really interested in trying out orange flesh sweet potatoes and they were willing to try it if a donor would buy them a bun cutter. And we inquired why is a bun cutter important? I think it’s important. What is it about a bun cutter that makes OFSP work? And they confided in us, well, nothing. We just don’t think OFSP will work and we really want a bun cutter so at least we’ll get our bun cutter. That’s a sign that we may be pushing industry to partner with us perhaps too much or in a case where there’s maybe not the most viable business case.

A bit of background on Malawi helps to understand what we were seeing. And I think important and from a development sector lens concerningly we’ve seen some real decreases in incomes in Malawi in the last sort of five plus years. We’ve really seen the GDP per capita of Malawi go down. And related to that, we’ve seen the size of the upper and middle classes actually decreasing while we’ve seen a lower-class increase. And so again if you remember our analysis on who consumes processed food and particularly bread, it’s not a good thing to see the upper- and middle-class market shrinking. That makes it hard to believe that there would be a business case in bread.

So as we ran the numbers, looking at this, we used a generous ten percent market share which is actually even higher than what we used in Kenya. We sort of attempted to predict the market for OFSP bread in Malawi. And using the examples we could only come up with a margin of about a million dollars annually. Now that is not necessarily not an interesting business case. Coming back to the definitions that were presented around a business case and investment case, it could be the case that a million-dollar market is interesting for a small cottage industry, for a producer who is already there to tiptoe into something new.

But it’s certainly not going to attract commercial scale investment and particularly given that it’s shrinking it’s unlikely to be a market that is going to generate a significant impact in years to come. In fact, we found in Malawi that probably the most exciting case would be to just increase raw, consumption of raw OFSP, very healthy. Ironically, it’s actually eaten more in Malawi than in either of the other two countries we looked at already. But there’s still a dramatic opportunity to increase

consumption. We see that urban Malawians eat OFSP once or never for more than half of urban Malawians.

Rural Malawians eat it even less frequently. And given its cost per calorie advantages and its nutritional advantages there's a real opportunity there. And so, our recommendation was in Malawi it makes a lot more sense for folks to consider driven activities or other activities focused on increasing consumption perhaps through school lunches or through other opportunities.

Now the last country we'll go to – and this one is a very quick consideration, is South Africa. And as we looked at South Africa, on its face it looked like a very, very attractive opportunity. We saw again an opportunity for moderate cost savings through processes. We saw again a big export opportunity almost as big as Kenya. And additionally, we saw an opportunity for small holder farmers if they were to produce OFSP to potentially increase their livelihood. One point as we began to study the production of OFSP in South Africa that we discovered is that current yield was only about three tons per hectare which was dramatically less than small holder farmers even in Malawi were getting, much less in Kenya. And that shocked us.

And so, as we began to study what was going on there, we discovered that a) South Africa has very few small holding farmers. B) those that exist have already been diverted into higher value crops for local consumption and that c) there's not much of an opportunity to grow OFSP with small hold farmers. However, we did find a number of agronomists that were very excited about the opportunity to obtain yields of up to 25 tons per hectare which is much higher than the other countries by leveraging South Africa's commercial agriculture industry.

As we looked at farm gate prices, we also saw prices that were potentially higher than we saw in East Africa driven by substantial local market consumption as well as already very small presence of exporting of this. So this became interesting to us as we thought that there might be an opportunity here. As we began to size the market for bread which is an interesting market in South Africa by the way because the majority of bakeries are vertically integrated into wheat processing, not to have a cost advantage.

So it's only a small segment, a niche segment of less than half of the bakery market that we would be able to convince maybe to move to OFSP. And perhaps it could be interesting for that market to give them some level of distinction and it would mitigate the price advantage that some of their competitors have on wheat. So as we began to look at that however we again saw the trends that we're so used to seeing around it actually being middle- and high-income consumers that are eating bread.

So as you saw back when it was laid out the business case that we're seeing in South Africa and we said ok. We think that we can help increase incomes for commercial farmers and in doing so we can generate a product that will be consumed primarily by wealthy South Africans and could potentially also be exported to Europe. And I think we had to admit there that there was very little impact case left or case through which to attract a development actor. And so, I wish the commercial sweet potato industry in South Africa well but I don't think it's a key focus for us as development actors moving forward. So that wraps up our formal presentation here. And again, apologies for moving so quickly through so many of these. But we are seeing these big questions.

[End of Audio]