**The Health Edge**

**Mark Pettus and John Bagnulo**

**Prebiotics-Fiber and Health**

**July 1, 2016**

|  |  |
| --- | --- |
| Mark: | Welcome to the health edge translating the science of health care. I am Dr. Mark Pettus and with my friend colleague, Dr. John Bagnulo - John, good morning, buddy. |
| John: | Good morning, Mark. It's great to see you. |
| Mark: | Nice to see you on this July 1st day. Summer just here in full blossom. It's a great time of year. |
| John: | It is, definitely. You got plans for this, hopefully it's a long weekend for you? |
| Mark: | Yeah, it is a long weekend, and I look forward to long weekends more than ever these days, but we're just going to drop anchor at home and do a lot of outdoor stuff. Get the kayaks out. My wife Leann and I in the last few years have gotten the kayaks out and watch the fireworks from some of the local lakes. |
| John: | Nice. |
| Mark: | It's just so nice being out there. It's a total different experience. We'll just law low and have some fun with the family. How about yourself? |
| John: | Well, we'll probably be pretty busy packing, but we do hope to spend some time outdoors. I think they have a pretty good firework display here in Yellow Springs. Hopefully we can get the kids over to that. |
| Mark: | Yeah, this is the one time of year where I'd rather not be on the road. I'm always glad not to travel during these peak travel times and just let go. The Berkshire, it's like an alternative universe here in the summer. Everything just comes to life with theatre, so I'm going to be seeing Bob Dylan. |
| John: | Nice. |
| Mark: | Tomorrow night at a place called Tanglewood, which is just this unbelievable venue in the Berkshires that is the summer home to the Boston Symphony. There are a lot of plays and theatre. It's a festive time. We have a lot of fun. |
| John: | That's great. |
| Mark: | It's good. Family's doing great. Can't ask for more than that. |
| John: | Absolutely. |
| Mark: | We talk a lot, John, and will continue to be talking an awful lot about the role that the human microbiome plays in the promotion of health and certainly diseases as we understand it and that understanding is certainly going to continue to evolve in a remarkable way. The extent to which, of course, diet and in particular as we'll focus on for 30 minutes or so this morning, fiber or prebiotics play such an essential role in the maintenance of that ecosystem. I know, John, any time I listen to your talk on the ancestral origins of human dieting, nutrition and how different that is from the standard American diet, the one point that you always make that gets my attention is really the difference in the amount of fiber we consume with contemporary diets compared to ancestral diets and how fiber should probably be a food group, right? |
|  | This is one of the dramatic differences you would point to as at least one of many reasons that we are seeing this epidemic of chronic complex disease. |
| John: | Yeah, Mark. I think that both the quantity and quality of fiber in the modern human diet is just so radically different from what our ancestors ate. It's really fascinating. If you look through all the peer reviewed journals on fiber, it doesn't matter what age you're looking at. For instance, in pediatric nutrition from around 1990 to today, most pediatricians have a guideline where it's 5 grams of fiber plus the child's age, so if you're dealing with a 4 year old, for instance, they said that the upper ceiling of fiber intake should be around 9 grams of fiber. |
|  | What's fascinating about this is if you take a look at the research, whether it's Human Gut Project or it's the work of anthropologists, spending time with free living hunter/gatherer populations, many children by age 3 are getting 70 grams of fiber. Again, these are just enormous differences in terms of what's being recommended and what's actually being practiced by free living hunter/gatherer populations that would most closely represent our ancestral way of life. When you take a look now at the quality of fiber you see that children living in the United States, for instance, and most areas of what we call industrialized or the developed world, children are getting a huge amount of their fiber, and they're not getting much fiber to begin with, but a huge percentage of their fiber, I should say, Mark, from bran, which is again found on grains, whole grains. |
|  | This type of fiber is so different than the type of fiber we get from vegetables, root vegetables, small green leaves that, again, these hunter/gatherer populations are foraging for and that our ancestors would have eaten. It comes down to how do the different types of fiber, how do they feed different families of bacteria? Because these enormous different families and ratios of bacteria are favored by different types of fiber. |
|  | As we just talked, it's definitely one of the major differences between the ancestral diet and the modern diet is, again, the quantity and quality of fiber. It's really clear at this point in time that Americans, for instance, and again, Europeans, most people who are living predominantly on whole grains as a big source of their calories, that's where a lot of their fiber's coming from, they're not getting the best form of fiber to feed the microbiome that you just mentioned in the most diverse way. |
| Mark: | That, and I know you brought this up before, John, that's going to be an eye opener to a lot of listeners to this podcast, because people continue to think of grain based or bran sources of fiber as perhaps the most important and certainly that's where people are getting the most fiber in their diets. That's probably a good place to just elaborate on a little bit, John. What is it about those fiber sources that may turn out to be not as good or as health promoting as we thought it would be? These arabinoxylan, these classes of fiber, what makes them different? |
| John: | That's great that you bring up arabinoxylan as a big word for people and it's spelled very interestingly, but arabinoxylan is a major type of fiber found in the bran of grains. Wheat bran, for instance is loaded with it. Oats are as well. It's not as fermentable, really. I think that's a fundamental point. Maybe even more importantly is it really favors that particular brand as do gums and other types of fiber found in brand. They favor the growth of one very unique family of bacteria that I know you're very familiar with, Mark, but some of our listeners may not be. That's the clostridia family. |
|  | Now, here's where things begin murky for our average listener that is interested in having better health and has heard that it's important to eat fiber, that they should eat whole grains. When you take a look at their research on fiber in general, what we notice are a couple really clear patterns. One is not all fiber produces. When you do a follow up study and you follow a population, whether you're looking at breast cancer, you're looking at prostate cancer in men, not all fibers have the same level of long-term protective benefits against particular disease patterns. |
|  | Again, the fiber from vegetables in almost all studies is shown to be protective against not only prostate cancer and colon cancer but breast cancer as well. The fiber from grain is rarely shown to be protective against these diseases. This is most likely a function of the short chain fatty acids that are produced by different families of bacteria. That's a really, really important aspect of this discussion, is what families of bacteria prefer different types of fiber and what are the pros and cons when you start to feed these families of bacteria? |
|  | When it comes to the arabinoxylan that particular fiber type, a very specific fiber type found on the bran of many grains with wheat bran being the leading source. Arabinoxylan feeds clostridia. Clostridia does not produce butyric acid like bifidobacteria does. Bifidobacteria is another family of very important bacteria that we want to have based on all of the research. We want to have more bifidobacteria, because it is such an anti-inflammatory family of bacteria and really helps keep everything going in the right direction, whether it's protection against colon cancer or it's getting risk reduction with respective metabolic syndrome and [inaudible 00:10:04] resistance. |
|  | Clostridia is a family of bacteria that is favored by whole grains and it's really interesting when you take a look at this. At any stage of the life cycle when children have clostridia overgrowth, they tend to have a much higher risk for autism. When adults have a higher percentage of clostridia, they have higher risk for other conditions, but it's a very, very interesting component of the microbiome. Clostridia, interestingly enough, Mark, out-competes bifidobacteria and tends to push bifidobacteria populations to smaller percentages. |
|  | Now, when I said earlier that it gets murky, the reason it's murky that we're told eat more fiber, all variety of fiber types is beneficial to the microbiome. The reason we hear that is when we feed fiber to populations as well as in animal studies, fiber of all types tends to generate short chain fatty acids, but it's not all butyric acid. You can produce acidic acid, propionic acid. These are 2 and 3 carbon short chain fatty acids. I know you know this, Mark. I just brought a listeners. I'm trying to paint a picture here of what happens. |
|  | When you feed animals or humans fiber and you get these short chain fatty acids being generated, it drops the ph. It's makes the ph. a little lower in the digestive tract or in the colon in particular. That's always looked at as favorable, because we know that the lower the ph. in the colon, typically the lower the risk for colon cancer and there are some positive or favorable effects that are associated with a lower ph. The problem is when we hear the results of those studies, we don't know if the ph. is being dropped because of butyric acid or proprionic acid. If it's being dropped because of proprionic acid, the outcomes are not as good ... Not pulled or teased out of this type of research, so hopefully our listeners, hopefully everyone can follow that. |
|  | Fiber is not created equal and the fiber we get from vegetables is the best. We can go over some of the best prebiotics that there are found in vegetables. Again, naturally occurring. This doesn't require supplementation. Just requires a certain amount of concentration or focus on eating very vegetable rich meals. The fiber found in bran, whether it be fortified in some kind of box cereal, which I look at box cereals, one of the worst things that people can start the day off with. It's amazing that so many Americans in particular still look at some kind of whole grain cereal, whether it's sweetened or not. That they look at that as a foundation for a healthy diet, because I don't think it could be further from the truth, really. |
|  | The fiber that we're getting from bran is not as effective at feeding the microbiome and supporting the families of bacteria and the ratios of bacteria that ultimately we want to have. Whole grains in addition to feeding clostridia, they also feed prevotella. We know from all the research on the microbiome, you probably don't want to have high levels of prevotella, because if you do, you're at a greater risk for things like autoimmunity and a lot of different inflammatory based conditions. Yeah, Mark. I think there's just such a huge misunderstanding about fiber and so many people are directed in the end towards having more bran, more steel cut oats and things like that. |
|  | That's been really for the last 35 years or so, that's been the mantra, right? Eat whole grains and everything I supposed to work out. Well, it clearly doesn't work out both when you look at what's happened with our population, many of whom have been trying to eat more whole grains and when you take a look at the data. |
| Mark: | Yeah, I mean, there's just so much there, John, with what you shared. A couple of points just to reemphasize. One is that all fiber is not created equal and again, we're presenting a counter cultural perspective in the fact that grains are so heavily emphasized as a fundamental food group that can promote health that certainly in the American language it's usually healthy whole grains or whole healthy grains are just- |
| John: | That's an oxymoron. |
| Mark: | I mean, that is how they are referred to. What you're suggesting is that the fiber sources, these arabinoxylans, these fiber sources, they promote different bacterial populations to grow. At least from what we know of the research right now, these may not at all be favorable in terms of the clostridia and the prevotella profiles, that many of these are not fermentable fibers, getting to the colon where these ecosystems live and thrive. |
|  | Then there's this really fascinating issue of the metabolites of the fermentation process. You touched on acidic acid and proprionic acid and butyric acid. We know that these metabolic by products are in fact messenger molecules. These are molecules that seem to have significant impact on human biology. I know there's a lot on butyrate as a very health promoting short chain fatty acid. Even evidence, whether it's reducing colon cancer risk or reducing inflammation in its capacity to modulate and affect human biology on that level. |
|  | Even on an epigenetic level now there's some research suggesting that butyrate can alter these on and off switches right on the human genome and influence gene expression patterns. It's another interesting connection between something we eat, something growing in our gut, a metabolic byproduct of that relationship and one that even at the level of DNA and gene expression appears to be a very active dynamic signaling system. Even when you begin to think about these mechanisms, John, it's just incredible how profound these interactions are. They're happening everyday, many times a day, and of course usually we're not even conscious of how these things are impacting that. |
|  | You make the distinction between brand based fiber, fiber coming from other plant based sources, vegetable fibers, and particularly those that are getting to the large intestine and enabling a lot of this fermentation and growth and development and diversification of healthy strains of bacteria. When I start thinking about foods, John, that really can deliver on that promise, the first place my mind goes are the allium family, right? |
| John: | Absolutely. |
| Mark: | The garlic and onions and leeks. These are awesome sources of fiber. We know that we could be getting a lot more of these in our diet. |
| John: | Yeah. That's a great place to start, Mark, and I think they would be a top tier source of prebiotic because of the complexity of some of the very rich in fructooligosaccharides, which I'm sure some of our listeners at one point or another may have been advised to avoid. The fructooligosaccharide topic, it can be very controversial amongst people who work with individuals who have some type of gut disorder, but if you look at really ability to feed multiple families of what we call beneficial bacteria, and I know that's a broad sweeping statement, because it's probably more the ratios of bacteria in the GI. Just really the overall ecosystem as opposed to one particular family. |
|  | Fructooligosaccharides should not be looked at as a 4 letter word. They have a great ability to support the microbiome, these alliums that you mentioned with leeks being something that everybody should become more familiar with and not overcook. I think that's really important that people understand that, that if you take onions to the point where they've been obliterated with a pressure cooker or they've been sautéed to the point that they're basically paste, you've lost a lot of this very significant prebiotic effect. I think whether it's garlic, onions, leeks, scallions, the list goes on and on, shallots, trying to leave these a little more al dente at the end of the cooking process or eating some of these raw. Slicing raw onion onto a salad, chopping of leeks. There's just so many ways you can use these raw. Again, that may be the best example of a very, very fermentable fiber that will produce very, very favorable fermentation in the gut. |
|  | That's why people often have increased flatulence when they eat these raw. They say, "Well, it's not agreeing with me." I would argue that it may be agreeing very well with your microbiome. Flatulence can't always be looked at. It can't always. In some cases, it can be a sign of incompatibility, but when it comes to the alliums, what you're really when you experience increased flatulence is you're really starting to feel a turned up or accelerated rate of fermentation in the lower GI. That, for many people, can be a very good thing. That's a great starting point. I think they're, again, one of the best, and I would put really close to the alliums. I put Jerusalem artichokes, which are very different than your globe artichokes that people have had. Jerusalem artichokes can be grown anywhere in North America. |
|  | They're a member of the sunflower family. They're a small [inaudible 00:20:22]. They look and taste somewhat like a potato, but a little smaller and more knobby. Jerusalem artichokes, again, if fresh and they haven't been stored for too long. The more they've been stored, the more their prebiotics break down into a more simple, easy to digest source of glucose, but when they're fresh, Jerusalem artichokes are extremely complex, highly fermentable, and in a variety of ways, it can be used similarly to a water chestnut in some recipes, but they're going to be right there with the allium family as one of the best of the best. As we continue to talk about other examples. |
|  | You've got, of course, lettuce, which lettuce is an incredible food. It's quite often not talked about as a superfood, because it might not be as nutrient dense as kale or something like that, but I would argue that lettuce is one of the most compatible foods with human physiology. It doesn't contain anti-nutrients. It's a great source of fermentable fiber. It's a wealth of potassium nitrate, which helps, as you know Mark. It really helps enhance blood vessel dilation and support circulation in so many ways. It can be a great vehicle for whether it's adding goat cheese or tuna or hummus or whatever it is people want to eat without using bread. Using romaine hearts or making big salads with even iceberg lettuce has value. |
|  | That's another family. The whole green leafy but in particular family of lettuces and having big salads. Of course, that doesn't have to be what you're limited to in terms of food choice, in terms of salads, but I think salads are and can be one of the best ways to have increased fiber and the right kind of fiber, especially if you put shredded carrots and you put cucumber and you have cherry tomatoes. If you have a wide variety of vegetables on a salad with some good source of protein, you have a meal that's going to be very similar to an ancestral meal, which would have been made up of forest greens with some type of either meat, fish, or egg. Those are all good families. |
|  | Then if people do want to eat grain or they do want to eat pseudo grains, buckwheat is a great source of resistant starch without the antinutrients found in other grains. I would argue that if people want to eat rice, I think white rice, if allowed to cool as you and I have talked about, Mark, is another good source for resistant starch. I would argue for white rice over brown rice, which I know surprises so many of our listeners, but, again, I feel very strongly that the bran on grains is potentially more harmful than beneficial, whether you're looking at the mechanical damage caused by something like wheat bran, and that's been something well known, that it causes disruption and a certain amount of damage to the mucosal layer. That's why it generates more bowel movements or increased frequency of bowel movements. |
|  | When it comes to the antinutrients found in, for instance, rice bran or wheat bran, there's rich sources of phytates, which aren't always harmful in themselves but can make zinc absorption, other trace minerals more difficult. I think you've got really good choices within a variety of vegetables, but I think when it comes to the best of the best, I would look at anything in the allium family. I would look at members of the sunflower, Jerusalem artichoke family. I would look at things like uncooked beats and carrots. Parsnips. Then cooled starches like white rice or even a potato. Those would be all good choices. |
| Mark: | Yeah, those are great choices, John, and I love the fact that you brought up resistant starch, which I think about in a different category than fermentable fiber, per se. You talked about white rice and letting that cool. I enjoy plantains and it's just always great as a nice little stir fry with some coconut oil or butter. Plantains are a really good source of resistant starch. I think, though, this whole topic of resistant starch is a bit of an open issue in terms of health benefit. I think it's clear that as an additional way to bring more fermentable food to the gut microbiome is an important thing to think about. I know some people use potato starch almost as a supplement in an effort to try to get more fermentable food sources into their diet. Those are really good suggestions, John. |
|  | What about a lot of people, of course, look at things that from a Paleo ancestral perspective would be frowned upon. These might include legumes, beans, which we know are rich fiber sources. I tend to be a bit more forgiving with those food groups. Depending on how they're prepared and how people [inaudible 00:25:48] it. |
| John: | Absolutely. |
| Mark: | What's your take on that, on those groups, beans, legumes? |
| John: | I think they are that anomaly in terms of being an amazing source of prebiotic fiber, especially lentils, Mark. I think the smaller the legume the more compatible it is most often with human physiology. Lentils, for instance, and you're very, very small dark beans in particular, have an enormous amount of upside. Now, the downside, of course, is that they're very carbohydrate dense. They might not be a great fit for everybody. Some of these legumes, it's certainly true as they get bigger and bigger, is you move from lentils up to the broad beans like fava beans, you have an enormous upswing in the amount of lectins and these lectins can be very damaging to the gut lining as well and cause increased intestinal impermeability. Some of the lectins are very powerful if they do make it across a leaky gut or a high, high level of permeability in the gut wall. You wouldn't want some of these lectins to start entering circulation. |
|  | That being said, with lentils and Adzuki beans, a very small red bean, indigenous to areas of Asia and Japan, I think that because they're such a good source of fermentable fiber and because of some of these, again, as I mentioned, some of your very dark, dark beans like cranberry beans and your small black beans, those have high antioxidant levels. They have some anti-inflammatory properties in themselves. Those would be the ones that you just mentioned, Mark, as long as they were soaked extensively to get some of these lectins out and then cooked for a very long period of time. I mean, this is very different than with the alliums that you want to leave less cooked. Beans need to be cooked very, very thoroughly and they're still going to have all of this fermentable fiber that we're talking about today. |
|  | I look at lentils as something that some people may want to experiment with. It is that non-Paleo food group that can be controversial amongst your most orthodox Paleo people or of course your plant base nutrition people that look at them as a foundation food. I don't know and so I'm really going to align myself completely with one camp on this simply because of our topic today. How beneficial lentils and the small legumes can be to the microbiome. I think it's well established. I look at those as being one of those areas of nutrition where it comes down and equals one, right? |
| Mark: | That's right. |
| John: | How does someone respond to a moderate amount of lentils? It may be that they have lentils once a day or once a week, but I think it can be a good addition for people. It doesn't have to be, but if you're not eating lentils, as we just talked about, you got to make sure that at least two of your three meals a day are going to be robust in their vegetable content. That may mean a big stir fry or a big complex salad. That's simply because you do have to have a certain amount of this fuel for the microbial armies you want well represented. For some people eating lentils makes it just easier to provide the proper fuel supply for those microbes. I think that's great that you bring up legumes. I just think our listeners need to understand there's an enormous difference between peanuts and fava beans and kidney beans, which I consider to be one of the worst legumes to eat. Then your real small beans like lentils and Adzuki bean. There's a big spectrum there. Stick with the smallest beans. Cook the easiest. Lentils are the best example of that. |
|  | I would say out of all the families, the French green lentil and the black beluga lentil, those are the two best lentils. If I had to answer what are the best lentils to eat, those are the best, because the French green and the black beluga lentils have extremely high antioxidant values. Has a lot to do with their pigments. They have enormous amounts of fermentable fiber. They're just so versatile. They can be put in a soup. They can be cooked and then cooled and added to a salad, so those would be my top two choices. |
| Mark: | Yeah. That's great, John, and they're so affordable for folks, you know? |
| John: | Absolutely. |
| Mark: | I too come down a little bit more with Paleo light when I look at some of these variations. Similar with even things like dairy, where I think as people may find themselves in a particular camp, it's important to open up some of those boundaries in a purist way of thinking. Might otherwise deprive you of a choice that could serve you well, could be affordable. At the end of the day, it's always about meeting people where they're at. I find so many people I work with have limited resources will find lentils and beans, particularly black beans, an important staple. Rarely do I discourage it unless they have signs or symptoms to suggest that it's just not a compatible food for them. |
|  | Before me bring this home, John, people may, if they're reading food labels and processed foods will often see additives that will include the FOS, the fructooligosaccharides or inulin. You pick up these Fiber One bars, right? In all marketing and all processed foods, there is a concerted effort to try to inject some fiber sources into these foods. How would you guide someone who says, "Well, you know John, I'm eating this fiber One a couple times a day and I've got these power bars that have inulin in them." How might you confront that? |
| John: | It's really funny, Mark. If the food industry and we as consumers haven't learned it by now, you wonder when are we doing to get it through our thick skulls that you can't take what nature has developed over thousands of years, what humans have been exposed to over thousands of years. You can't shake up some of these very intricate balances too much without disrupting downstream effects. We screwed it up with Omega 3s. We add Omega 3s to everything and now some of the research on that is very compelling to say, "You probably want to be careful with Omega 3 supplementation," whether you're looking at childhood development or you're looking at different diseases that adults are trying to reduce the risk for. It's the same with fiber. |
|  | If you take a fructooligosaccharide or an inulin fortified product and you look at the way that that's going to be metabolized, the response within the microbiome, you're getting a major imbalance that can produce the very opposite effect that you're looking for, so I don't really look at those as favorable ways to increase fiber because it is so monolithic and it is so one dimensional that you end up producing maybe major changes within one family of bacteria, but you don't feed the population, the synergistic families that eating, again, whole vegetables, which have an array of fiber, fructooligosaccharides containing some pectin, containing some of the hemicelluloses, some of the celluloses. |
|  | You tend the with any vegetable, Mark, you tend to get at least a dozen different types of fiber. At least. There are some plants that give us 25 different types of fiber when you really look at the nuances of what's there. What that does is that feeds an array of bacteria that will hopefully grow in some close proximity to one another. As soon as you make this one dimensional, you take one of these fiber types and you put 3 grams of it in an energy bar or you put 8 grams of it in a box cereal. Forget about it. You're just not going to get the same type of balanced growth within the microbiome. |
| Mark: | Buyer beware, right? |
| John: | Yeah. |
| Mark: | That's always the mantra of John. Great discussion. We remind people of the importance of fiber and prebiotics and again not all are created equal. As people begin to continuously develop lifestyle strategies to diversify and enhance the balance of their microbiome, this is where the rubber meets the road. |
| John: | Absolutely. |
| Mark: | Though we didn't get into probiotics today and I know we've spoken a lot about that, John, we will close by reminding our listeners that taking a probiotic that has strains of bacteria in them, bifidobacteria or [inaudible 00:34:39] strains in the various species, it probably does have some role for some and modulating the immune response, but this is not how ultimately you are going to populate, repopulate, restore your biome. It's really in the fiber and prebiotic that you're going to have the greatest potential for biome restoration. That's really what we're talking about here. |
| John: | Build it and they will come. That's the model, right? |
| Mark: | That's great. |
| John: | Mark, just so I don't forget, I think our listeners, some may be under the impression that we need 25 or 30 grams of fiber per day. I actually lobby for 50 grams per day, which, I know many registered dietitians and gastroenterologists will cringe at hearing those recommendations, but that 50 grams of fiber from vegetables and some fruit and maybe lentils or other legumes depending on the individual, that's very different than 50 grams of fiber that comes from some all bran type fortified cereal. This is not sawdust. This is not bran. We're talking 50 grams of fiber that, as you know, has a long track record in human history. |
| Mark: | I love that, John. More is definitely better. We remind our listeners that depending on where you're starting, you really do want to be incremental here. If you go from zero to 60, some of the gas and bloating and cramping will be an inevitable by product of that, but almost always as we've emphasized repeatedly, when you are altering your metabolic landscape, you can anticipate feeling and experiencing something. Often when you persevere, what you're experiencing will definitely improve over time as you re-calibrate. This is a good example of a process that can take some time, can take some incremental change and stick with it. This is the equivalent of maybe feeling achy after starting out with some exercise. |
| John: | That's great. Yeah. |
| Mark: | If you let that achy-ness become a message that you interpret as, geez, I can't go here, then will deprive yourself of what could be profound opportunity downstream. Same with fiber and prebiotics. We appreciate people listening in and as always, check out our website, The Health Edge Podcast dot com or go on YouTube. We are always uploading content onto our website. If people have a minute to check us out on iTunes and give us a thumbs up, we appreciate that. We also have an app in the iTunes store for smart phones and for tablets. The app will allow many of these podcasts to be archived and that's all free. We hope people will take advantage of that. John it's great as always, buddy, to chat and to do the deep dive. |
| John: | Yeah, thank you, Mark, and thank you, everyone. I hope everyone has a happy fourth! |