

DIALOGUE4HEALTH WEB FORUM:
CONNECTING PUBLIC HEALTH and FOOD SERVICE OPERATORS:
CULINARY TECHNIQUES for REDUCING SODIUM
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>> Joanna Silber Hathaway: Hello and welcome to Connecting Public Health and Service Operators, Culinary Techniques for Reducing Sodium. My name is Joanna Hathaway and I will be running today's web forum along with my colleague Holly Calhoun. Closed captioning will be available. Josh Foley with Home Team Captioning will be providing closed captioning. Captioning is in the media panel, which looks like a small circle with a fill strip running through it.

In the media viewer window on the bottom right-hand corner you'll see show/hide header text. Please click to see more of the live captioning. During the web forum another window may cause the media viewer panel to collapse. Don't worry though. You can always reopen the window by clicking on the icon that looks like a small circle with a film strip. If you have technical difficulties, call 866-229-3239 for assistance. Please take a moment to write that number down for future reference. The audio portion of the web forum can be heard through your computer speakers. If you have difficulty with audio at any time, please send a question in the Q&A panel and Holly and I will provide the information to you.

A survey will open in a new window after the program. Please complete the evaluation as we need the feedback to improve our web forums. The presentation and media slides will be posted on our website at Dialogue4Health.org.

We encourage you to ask questions. To do so click on the question icon, put your question in and put send. Please address questions to all panelists. We will take questions during and after the presentation. We'll be using polling features. The first poll is on the screen now.

Please click on one of the available choices and submit the web button. Are you attending individually, in a group of 2-5 people, in a group of 6-10 people, or more. Please click submit.

Once you're done submitting the question click on the media viewer icon to resume closed captioning. It's my pleasure to welcome Kristy Mugavero to give an opening welcome.

>> Kristy Mugavero: Good afternoon, I'm Kristy Mugavero and I lead CDC's sodium reduction in communities programs. On behalf of CDC I would like to thank you for joining today. As many of you know, sodium reduction is a priority for CDC. In 2010 the Institute of Medicine recommended gradual reductions in the sodium content of packaged and restaurant foods as a primary strategy to reduce United States' sodium intake because about three quarters of the sodium Americans consume comes from packaged and restaurant food. In order to increase

access to choices, many health departments are working with organizations that sell or distribute food to reduce sodium content. We have learned so much at the level that state and health departments are doing, and we recognize their potential to accelerate this progress to connect with future industry leading collaborators. We have the opportunity to work the national public health institutes and a series of webinars to give you series of webinars to reduce sodium in meals and products sold in new service settings. We are thrilled to have a representative from the Philadelphia department of public health to explain the works we have done in partnership with independent Chinese take-out restaurants to reduce sodium. We look forward to this webinar today. Without further ado, here's Kelly Hughes.

>> Kelly Hughes: I'm Kelly Hughes the associate director for program strategy at the National Public Health Institute. This is one of four webinars working with health providers to reduce sodium. And this web series is supported through a collaboration of several organizations including the Centers for Disease Control, the National Network of Public Health Institutes. The Culinary Institute of America. We appreciate your participation and we hope you will join us again for our next webinar coming in July.

Now I would like to welcome our presenters. Today we have Brad Barnes with the Culinary Institute of America and Amanda Wagner with the Philadelphia Department of Public Health. Amanda Wagner will present on here experience of working with Chinese food restaurants to reduce sodium. Get Healthy Philly, she works with stakeholders across the city to help people become healthy and active. She has worked on food system issues in Philadelphia with a variety of organizations and nationally has served as a congressional hunger fellow in Arizona and Washington, D.C. She holds a master's degree in city and regional -- multiple, two master's degrees in city and regional planning and on public health administration from the University of Pennsylvania. We're so grateful to have Amanda with us.

Our second presenter is Brad Barnes, director of CNA consulting and industry programs at the Culinary Institute of America in Hyde Park New York and is the college's North American association of food equipment manufacturers professor. Chef Barnes is responsible for the oversight of the food certification program and customer training. Brad is a graduate of the Culinary Institute of America, a co-author of several books and a certified master chef among many other titles and honors. Brad has been a mainstay presenter through the series along with his colleague Sanna Delmonico. Unfortunately Sanna couldn't join us today but did contribute to the contents Brad will be presenting. So we would like to give Sanna where credit is due. She's a senior manager for strategic initiatives at Culinary Institute of America at gray stone where she manages health and wellness programs including Healthy Kitchens, healthy lives and the CIA Healthy Kids Initiative. She has taught at Santa Rosa Junior College and published a nationally distributed newsletter for parents and pediatric professionals called Tiny Tummys. Before we hear from Amanda we would like to hear from you all through another polling question. Poll number 2. Please select which of the following sectors you are representing. A., food service, B. public health governmental C. public health other including nongovernment or quasigovernmental, D academia, or E other.

If you're using closed captioning in the media viewer you can click under the media view icon, which is the circle with the film strip to pull back the closed captioning. Throughout the presentations today we encourage you to submit questions through the Q&A feature. We hope to take a few questions after Amanda's presentation before we continue to the Culinary Institute of America's presentation. But we also have more time for a more substantial Q&A presentation later. Now it is my pleasure to present Amanda Wagner. The floor is yours.

>> Amanda Wagner: Great. Thank you so much. Good morning or good afternoon, depending

where you're joining us from. I want to thank our hosts for inviting Philadelphia to talk about the Healthy Chinese Take-out Initiative. We're excited about the partnerships and some of the progress we've made and are also excited to learn more from other folks as we share what we've done and what might be applicable in other places. I want to thank my colleague Jennifer who couldn't be here, but she's been our team and leading a lot of the success we've been having in this effort.

As Kelly mentioned I'm the program manager with get healthy Philly which is with the department of public health. It's reducing and eliminating chronic disease by making healthy choices easier. Healthy eating and physical activity is a big part, and Chinese take-out is a huge part of that in Philadelphia, which I'll talk about in one second.

>> Amanda Wagner: We partnered with the temple university center for Asian health, the Asian health coalition and the greater Chinese on this initiative. I would say that great culmination of partners has been key in that process. We collected Chinese take-out for a variety of reasons. First across Philadelphia, there's over 400 of these restaurants, and they're located particularly in low-income communities of color, as you can see on the map to the right of the screen. The red areas are higher in poverty and the dots are a participant in our initiative, and you'll see they overlap. The goal of the initiative is to decrease the sodium content in these dishes by 10-15%. We chose a realistic goal. We didn't want to have a lofty goal. We chose 10-15% so we could make gradual changes over time to be more effective. We also felt customers might be more likely to notice more subtle changes in sodium, and it would give consumers an opportunity to adjust to the lower salt taste.

These are in communities lower income and communities of color that tend to lack access to healthy food. We note that Chinese food can have higher sodium just due to the sauces they use that apparently have higher sodium.

So the pieces of the initiative were first to do an assessment of the chef, owner's attitudes and beliefs to salt, and then do lower sodium training, which I'll go into in a second, to distribute low sodium cooking materials to include measuring cups and spoons and then fall up with onsite support. We also did customer taste tests and an independent sodium analysis of meals at baseline and then at 24 months after the training. I'll go into each in more detail.

First for the baseline surveys, 221 owners completed the survey. We found a couple interesting things. We found that most owners know that too much salt is harmful for their health and more than half, a little more than half thought that restaurants should reduce the sodium content of meals. But we saw that owners were less likely to know that restaurant foods are one of the main sources of salt in our diet. We were surprised to see that about 40% of owners reported their customers do ask for low salt. So this is at baseline before initiative. Overall the owners were interested in making changes but needed assistance and direction in doing so. The first piece I mentioned is the trainings. The owners attended one low salt cooking training conducted by a professional chef. And partnering with a professional chef was key to this initiative. Pictured there is chef surely Chang and she teaches at the Culinary Institute of America in New York City and specializes in low sodium Chinese cooking. So she had knowledge of the Chinese cuisine, but also how to utilize low salt in that cooking style. So it was really key to be able to have her provide this training to the owners.

The training included general information about salt and its impact on health. Also how to decrease salt in food prep and cooking. Talking about different strategies. There was a taste test where they tasted products with different levels of sodium and then a cooking demo. The restaurant association identified the two most popular dishes in Chinese take-out in Philadelphia which for the record are shrimp and broccoli and chicken lo mein. The chef actually made those

dishes in the training and they cut the salt by 20%. So they were featured within this training.

This is an example of some of the promotional materials we've developed. There's a window decal that goes in the window of participating restaurants, a magnet on the right for owners to remind them of the message, and we also have websites that have maps of participating restaurants.

More recently we've also had ads in Chinese news media. We've found that the restaurant owners were really excited about the opportunity to be recognized among their peers for the work they're doing with this initiative along with other non-Chinese media sources more recently. We developed a kit that was given after the training with recipes and more information.

This is an excerpt from the tool kit and these are some of the strategies we talked about in the training.

And then afterwards. You can see we gave owners a variety of strategies to choose from which is an important piece of this, because not every restaurant was going to be able to reduce sodium if there was just one strategy that wasn't as effective. So there's a variety of strategies here, both adopting the recipes that were provided or just using less sauce. Not giving out soy sauce packets as default, adding other flavors. I won't go into all of them. You can see the examples here.

And then the next slide, so this is an example also from the tool kit of the revised recipes. So it was following up on the training with an example of them. This is for shrimp and broccoli and then chicken lo mein. We also provided a shopping guide. So we had identified the two largest Asian food distributors in Philadelphia, where most of the restaurants were already getting their food. And there's an inventory of the products they had and helped identify what were some lower sodium products they already had in their inventory.

I should note though that only soy sauce is physically labeled as low sodium and we're finding it to be sometimes twice as expensive.

So we chose the lowest sodium option of those available. We're still working with distributors to identify other potential strategies, including how they might be able to have more cost-competitive, lower-sodium ingredients. But it's an ongoing discussion and may eventually involve engaging manufacturers as well up the chain to see if lower sodium products can be made available.

After the training in the tool kit we wanted to ensure we still had ongoing touch points with restaurant owners. So we had check point visits to see if they were adopting the strategies and also to provide additional materials or information to sort of boost their training at the same time. And sort of get feedback from the owners how it was going.

We found that all of the owners were implementing at least one of the strategies I mentioned before. So decreasing the amount of sauce, using fresh produce, et cetera. And we asked their feedback on customer perception and acceptance because that was one of their concerns initially as well. They did say the majority of customers thought that the taste was still just right.

The sodium analysis I mentioned. This is a chart showing that. That's from around a range of restaurants, a sampling of restaurants. Not all of them. It's a sample. Some restaurants were sampled multiple times.

So the baseline is all the way on the left. Each line represents a different dish that we sampled. So we added a third dish, General Tso's chicken that was not a component of the training because we wanted to see how they would adapt these changes across the menu. You'll see for chicken and broccoli, the most significant drop was in the first 6 months, but

they're still continuing to sustain that reduction over time. Which makes us think they did sort of institutionalize these lower sodium strategies.

General Tso's, no, but it could be because of challenges in the preparation. The chicken is marinated for example, so it might be more difficult to reduce the sodium.

But they're exciting results we're seeing and we're going to continue to evaluate, even in restaurants that had reductions across all three dishes, maybe comparing that to other ones. But we're very excited about this progress so far.

>> I want to make a note that this shows the sodium amount plus dish at 24 months. The last analysis we did. Comparing it to daily sodium guidelines. And on the right is our city Philadelphia recommended guidelines. So you'll see there have been exciting reductions, but that is still above the daily dietary sodium limit, or at least above our guidelines as well. So we want to continue to think about ways that we can make reductions over time.

I mentioned some of these already. But overall these are some of the successes. Having a restaurant strategy has helped with the restaurant owners and has certainly helped with recruitment and ongoing feedback and a way to recognize restaurant owners. Having a professional chef involved. And the owners are really interested and committed to making changes and interested in the health of their customers in their communities. And we've also developed good evaluation measures including the baseline survey and sodium analysis to have both objectives and qualitative feedback.

Some of the things going on are just the nuances in Chinese cooking and ingredients. Sauces are already sometimes inherently high in sodium, so how do you sort of work within that. Will there be a feeling they will be able to reach of doing reductions. The cost of lower sodium ingredients like I mentioned, and really thinking about what are other ways that we can identify cost-effective products and ingredients. And then continuing to get feedback on these preferences, or at least addressing any perceived challenges with customer taste preferences.

One thing for example though is that the revised recipes were a bit more spicy. So some of the feedback was around that. How do you sort of replace salt with spices and adjust taste levels to meet people where they are. So that's a continuing conversation we have.

The next steps, really quickly, to wrap up, is continuing to follow up with participating restaurants, to monitor behavior change. We're continuing to provide training to owners to help them continue to implement changes, and working with distributors like I mentioned, about the affordable products. We're also doing additional outreach in communities. Now that these restaurants are ongoingly making these changes, we want to continue to promote that within the community. Both that there are low salt options available, but just getting information on the impact of sodium and health. This is a snap shot from the website. We also have a data brief there that summarizes a lot of our information and there's a map of participating restaurants and a lot more general follow-up. And this is my contact information. You're more than welcome to reach out to me with any questions or thoughts. I'll turn it back over to Kelly.

>> Kelly Hughes: Thank you so much. That was such a useful presentation. I want to encourage anyone who has questions at any point of the presentation through the Q&A feature. We have a couple moment for questions. I'll kick us off. Can you communicate any cultural or lingual challenges you encountered working with restaurant owners and also in the development of your promotion material?

>> Amanda Wagner: That's a good question. I should mention that the training we conducted was in mandarin and the chef spoke Chinese, and that all of our materials have been translated. So they're both in English and in Chinese.

With the promotional materials you'll notice the magnets for the chefs were also

translated. Having it at the Asian health coalition and the restaurant association really helped address that language barrier.

>> Kelly Hughes:

>> Joanna Silber Hathaway: Great thank you so much. The training that the chef provided was great, having someone who not only speaks the language but also has the experience of creating lower sodium dishes that are culturally appropriate. I am curious to know, was this single training provided or was this training where the chef provided multiple times for an audience, was it recorded. Just curious how that was facilitated or provided and how that may be disseminated, or if that's an area you're interested in kind of looking at moving forward.

>> Yeah. So the initial training was in person for two different cohorts of restaurants. So there were two in person trainings for two restaurants that signed up. We integrated the recipes and the materials in the tool kit and then incorporated that into the compliance checks and booster trainings. So when we would do onsite visits afterwards it was sort of a refresher of the skills that were available.

The chef has been available as a consultant. So as we're thinking about potentially-new recipes to develop and providing other resources, she's sort of been available on hand. Having it recorded is a good question.

I'm not sure if we did have it recorded, but I know we have her slides and are able to sort of share that information as there's more follow-up interests.

>> Great thank you so much. We have a question from the audience. Are there plans to implement a similar strategy with other restaurants and/or other types of food high in sodium?

>> Amanda Wagner: That's a really good question. It's definitely something we're trying to think about. So what from here can be adaptable to other types of independent restaurants. Also these restaurants tend to have a lot of "American" food they serve. So maybe there's an opportunity to even expand across their menus. I think having a restaurant association on board, like I mentioned is really key to that. So it would be good to figure out if there were an equivalent for other types of cuisines in Philadelphia that would be interested and also be part of that conversation.

>> Joanna Silber Hathaway: Thank you, Amanda. One question I have that spans beyond the work you're doing and I think others would be interested to hear how you're approaching your work with distributors or manufacturers. I know it's in the early stages. Just hearing how you approached that, do you have a gatekeeper, someone that is a food distributor or manufacturer. Have you developed those relationships on your own? Just curious what kind of process you have taken and how that's gone so far and maybe what advice you might have for others.

>> Amanda Wagner: For the distributors we have been connecting through them through the temple center for Asian health and the restaurant association. Both from a language perspective and then also they've had different connections through the restaurant owners. So they've sort of been our main contact with the distributors. In terms of manufacturers, I think they're still trying to determine -- that's much more regional and national and even international in scale. So it's not like they're all focused within Philadelphia, so I think we need to think through a little bit more who those contacts can be and also if there are other communities that would want to combine with us to make connections with those manufacturers.

So I think that the manufacture piece is still a little bit unclear. And then it's also other types of ingredients. So the distributors we have been working with have been a lot of sauces like you saw in the tool kits. So are there other ingredients like noodles. We're still sort of learning the landscape of foods out there. And then the next question would be who can help us make those connections.

>> Really underscores the value of work relationships. Thank you for your discussion and thoughtful presentation. Now we would like to move to the second presentation with Brad Barnes from the Culinary Institute of America, and he'll be discussing how different ingredients, global, and flavor profiles and techniques can be used to increase taste without sodium, on a small or large scale. I encourage the audience to continue to submit questions, and we'll take those at the end of the presentation. But for now, Brad, please proceed.

>> Brad Barnes: Thanks, Kelly, I appreciate it. And Amanda, thank you. That was really some very cool information you shared. And further was illustrative of a lot of the things we have spoken of in the webinars and today. Not to mention you highlighted one of our primary faculty there, Shirley. We go back many years and even have toured China together. That was I'm sure an excellent job. Demonstrating the connectivity you develop with the restaurateurs, and you mentioned great ways to do that, whether it's the restaurant association or even a cultural meeting place like the temple you spoke about. Certainly all very, very important things and ties right into what I'm going to talk about today.

Because as we've said through many of the webinars, the connectivity that we develop and the way that we form relationships with the folks that we want to get to change things is critical. So what I thought I'd do today is speak more from a chef's point of view and just talk a bit about some things that are very meaningful to chefs when they think about food, and certainly even operators and owners that understand the effect of culinary when it comes to the importance of what goes on in their operations.

So to get that started, I thought we'd say "why salt"? And really make sure we understand what salt is about from a cooking standpoint, there are certainly functional and beneficial uses of salt, meaning whether it's a preservative or a governing factor when it comes to leaveners. There are many ways that salt does provide a truly meaningful, functional benefit to food. Beyond that, it's very good at covering up poor technique and poor ingredients. And it makes things that already taste good taste even better, to a point, depending on your tolerance for the effects of sodium.

It can make things instantly tastily i.e. if you have just ever taken plain popcorn that doesn't have salt and put salt on it, it's a whole different thing. Whether or not that's your taste. Probably is. French fries are another great example. Without salt is one thing, throw a little salt, something different.

So it certainly does some kind of mystical things. And of course -- and this is exactly a lot of what Amanda was facing, is it is a cultural staple, and whether that means cultural from an ethnic standpoint or just from a professional culture that we, as cooks and chefs, use salt in certain places and times in order to accomplish certain things.

So with that kind of said, I'm going to go through a few topics here and just give you some things to think about. Hopefully it will be helpful. One of the things when we think about technique, and I'm standing there in Marisella's restaurant in Sao Paulo Brazil. Marisella is considered one of the founders of restaurant cuisine in Brazil. She's a fascinating chef. And there in front of her is a very simple technique-based dish that has beef and spices and squash and it's all stewed in that pot for 24 hours, on a flame, and then she presents it every Sunday in her restaurant.

The point being that technique for culinary, and it's something that's very, very important. That's what makes the difference between a great cook and a good cook. Top ingredients take time and they take skill. Thus the need for Amanda in Philadelphia to present training. Cooking methods add to deliciousness, but they do take a level of understanding and education in order to be able to know which methods to use when and exactly what those methods are about and

what they do.

You always have to think about the balance of flavors, and we're growing to talk a lot more about that. Textures are critical. Colors are critical.

And then of course to create some type of recognition to a customer through flavor-profiling. So today we have one of our poll questions. I hope everybody will take a shot at it, but this is about figuring out which of these little groups of flavors goes to which country. So I thought it would be interesting to see if folks out there could select the appropriate country for each of the flavor profiles listed below. And you will need to scroll down in the poll in order to get to each of those. But just take a minute and do that. I think it would be interesting to see how that pans out and we will actually give you the answers a little later. So I appreciate that.

One of the things that is really important to remember is that everything that we do in a food service business is about a sensorial effect. So taste and flavor are a culmination of our senses. That's what keeps people engaged in our businesses. And when I say "our businesses," make sure I understand that whether they're a hospital patient or someone in a geriatric care facility, or somebody in business and industry having lunch from the office, or a private restaurant, it's all fundamentally about the same thing for most people.

And that is a break to enjoy and to have something that you like, and to have these sort of sensations occurring.

That's really what eating is about, other than the functionality which of course would be to nourish yourself.

So to further understand taste a little bit. There is kind of an old adage, the pallet map if you will. And we know that doesn't exist. That's not the way that your tongue works.

And as a matter of fact, the more we look into things and the more we try to understand flavor and what it's made up of. Of course, the taste sets, if you will. So salt, sweet, sour, bitter. We all get those.

Umami which is incredibly important to our work for reducing sodium. And then the other things there like fat and alkalines and it even looks like umami listed twice, but probably a good thing because it's a critical, important factor in the way that we move this work along.

That actually, interestingly enough, is something that is perfectly intrinsic into Chinese cooking. And many Asian types of dishes. Of course it occurs all over the place, but particularly in those with a lot of the products that they use. As you get into it and product availability, which is interesting, there is a number of way those dishes can be changed and in fact, in many cases to become more authentic, which is what I'm sure Shirley was after, all along while reducing the sodium content. So that's a great culture to begin with.

We always talk about key strategies in these webinars. If you've been returning at some point, you will understand that. But the strategies so far have been about measuring salt, seasoning foods with spices and herbs, applying menu forensics to really understand what a menu is about and how it performs before we make changes. Always remembering that anything we do that changes anything is affecting the business, and it should be built around sound business decisions.

Tracking primary purchases and creating benchmarks so we know how much of what we're using. And that's a great way to get measurement data on the effect and the success of what we're doing.

Then designing menus and recipes to those benchmarks and using that as a tool to be able to further manipulate what it is we're going to buy and what the goal of what we're going to buy is.

And then increasing salability through variety. Because we all know that as we look at

making our diets better and more wholesome and more nutritious, generally it means more plants, less animal -- and of course with plants comes a tremendous amount of variety whether it be flutes, vegetables, nuts or seeds or any of those. So some really cool concepts there.

So key strategy No. 8, and we'll talk quite a bit about this, is to use the group. And by the group, I mean the senses. And we need to understand all of those and their effect or their collective appreciation, if you will, of what we do with food, in order to manipulate that.

And all those things really do play well together and are very useful tools. Successful offerings that we create have to connect with more than just a good concept or a good idea. So there's details in there and variables and things we need to manage in order to make a good idea come to fruition and be successful.

As mentioned earlier, we urge people to create things for sales. Meaning things that will sell well, will do well, and ultimately outperform things that maybe are not as good for you. In that menu forensic idea, there's a strategy that you can pose things against one another in order to create interest and get things that are better for you to sell better, by simply making them look as good as they really are.

Coupling textures, colors and flavors to entice people. That's a very basic critical piece. And hopefully today's information will help you understand a bit more about that. A food's flavor comes in combinations. And it's through the combinations of ingredients.

It incorporates all the senses. Taste, smell, sight, sound, and even touch particularly through the effects that chilies have on your tongue for instance. While not everybody enjoys hot to a strong degree, many do, and some enjoy at least a small amount of picantness. It has great health effects besides just the fact it makes your palate excited which in turn can make your palate act like it's been exposed to salt.

So there's some basic kind of chemical things that take place there as well.

So kind of to prove sight is really, really important, and it's just something to remember. Because if we want to entice people to take things, they have to look good. We'll show you some photos here, and I think you'll see immediately that it does stir your senses because you recognize -- we know that the food on the left is hot. We go wow, it's hot and steamy and looks really, really good. We see that steak is probably cooked very well. Very succulent, very juicy. Probably delicious. That's going on in your head right now, whether you know it or not.

And then those bright, shiny, crisp, fresh-looking vegetables say to you, This product is in good shape and probably tasty.

That's a very fundamental instinct almost, if you will. Because of course when we used to forage, and that was the only way we got food, one of the things that would attract us was color. Color and things that were standing still, so thus we ate a lot more plants.

These things indicate important factors about food. That's really the point of this slide, was to show you that it's a very kind of profound piece of what we're doing when we create dishes.

Remember, I'm trying to get you to learn about this so that as you talk to food service operators, you can relate to what's important to them. And you can move them along. I think Amanda said a number of things that had to do with assisting operators to being better. And I think that's where the primary role that most of the grantees can serve. So again, really great stuff. The next slide I'm going to show you is you're going to immediately recognize things. And you're going to be able to -- and won't be able to, actually -- keep yourself from imagining the taste, because of the way they look.

So once you do that, look at that. And there's an interesting kind of phenomenon there that you're going to recognize about 95% of what you see, and then there's a little part that you

don't recognize. And that's going to have a different perception effect, if you can kind of recognize that.

So this is just a fun little photo. Nothing groundbreaking, but it looks fresh. It looks tasty.

And we know, even the sound. You can imagine the sound that that bread made when it got cracked open. We know what the shrimp tastes like. We know what avocado tastes like. We know this is fresh and cold. Nobody thought that was a hot dish.

The red stuff there, it's hard to tell what it is. So there's a confusion. And that's just kind of the interesting sort of visual remark I wanted to make. But the point being this immediately calls up all your senses to think about what's going on in this photo. Again, the kind of impact that even a grilled cheese sandwich or a bowl of soup can have for somebody.

I want to make sure that we know this can all be applied to very straightforward food, very average day to day foods. And it is one of the best things that the best chefs can do, take the most simplistic things and make them be meaningful on a number of different levels.

So perception of sodium is a really interesting thing. I thought it might be important to kind of consider how that really is recognized. Certainly it depends on the concentration of sodium in the food. Or top-salting as opposed to integrated salting. We're finding in our research it's much more recognizable to salt something at the end, even on top. And you can use less salt that way to make it recognizable and give that satiety that people are looking for from salt. If you work it into the preparation, as with many processed foods of course, it disappears, and could actually require re-salting in order to make that palate recognition that so many people would be looking for.

It can change -- thinking about a soup. The sodium level needs to be different to be recognizable than perhaps something you chew for a long time.

And then we're going to talk about these other sort of things that contribute to that satiety and that recognition of what your palate is looking for to be happy, if you will.

Of course salt affects the entire oral cavity. As we said, there is no particular spot on the tongue that senses salt.

Depends on the food matrix. We just kind of said that. So liquid versus bread and how that kind of happens on your pallet. And of course depends on interactions between taste compounds.

So that we know that umami can enhance the presence of salt. We know that acid can replace the presence of salt. So there's some interesting things there.

Another critical factor worth noting when it comes to making food taste delicious is what is known as the Maillard effect, which is the browning of proteins, which causes one of the most pleasant, intense flavors that people recognize. Whether it's a bran muffin, piece of toast, a roast chicken, a seared piece of tuna. Whatever it is that's caramelized proteins in order to create that brown flavor, if you will, which does in many cases contain a high level of umami, then that really creates a huge taste pleasure that of course reduces your palate looking for sodium. Intense heat does this better. It also tends to remove fat.

And a great component with this brown flavor is citrus. So if you think about it. If we're comparing caramelization and we're adding acid -- lemon juice or lime juice or something like that -- with that as a flavor profile, the need for salt for most people's liking depletes way down.

So these are interesting ways we can approach the creation of dishes in a very simple way. If you think about lemon-flavored croutons in a salad maybe lowers the need for salt.

Taste interactions particularly, and here's just a few. Is salt and bitter typically cancel each other out. So if something's very bitter, we can put a lot of salt on it and still not get that satiety. So an interesting kind of a caution there. Salt and umami enhance each other, so they

very quickly cause recognition to each other.

Sour is an additive with salt, meaning that sour replaces saltiness. Salt enhances sweetness.

Caramelization and citrus of course richness and mimics salt. Fat and acid suppresses salt and adds flavor complexity. So done right, with the right ingredients, fat and acid can be great thing to take the place of salt. Particularly with some flavorful acid.

Another piece to consider when creating dishes and menu items and things is that we want to remove salt from dishes, is fresh herbs.

Fresh herbs have been proven over and over to kind of take the place of what people are looking for in a dish from the standpoint of salt.

So herbs and reducing salt happen in a number of ways. There's been a few studies, and it's typically with things like soups.

So canned soups with varying levels of herbs, when they're evaluated, consumers tended to like the soup better and greater, over a period of time. I'll show you a chart about that in a minute. As herbs were used to replace sodium levels in canned soup.

So the idea is that the inclusion of these herbs and spices enhance perception of the salty taste of a soup that actually had been lowered in sodium.

And then as people kept eating this. Meaning over a period of days, they like it more and more and more.

So there's sort of an interesting -- sort of familiarity factor when you learn a new taste. And herbs are relatively new to many people. But as you learn a new taste, your brain tells you whether you like it or not or whether you think you want to like it.

And there's many influencing factors there. But if your brain tells you you should like it and you kind of want to like it, over repetition, as we've all heard over the years, "you'll develop a taste for that." That's what is kind of demonstrated in these studies of herbs. In this particular study in the little chart here, it shows that there was herbs added to a particular soup. What happened is over time this soup increased in liking, but the one that had a higher level of herbs was not liked as well at first, but then had gained in liking over a period of three days. So kind of an interesting perspective there.

The idea would be teaching people to use herbs and spices would be an interesting strategy to be able to get folks to make food taste more to their liking, or even better than the salt affected item, once they learn how to do that.

So this particular study where they used herbs and spices. It led to an average intake of 966 milligrams a day of sodium less than the group that didn't receive the intervention.

They kept showing them where to put herbs and where to put spices. And over a period of time, they enjoyed the flavors of the herbs and spices better than adding the salt. And therefore did not need to add the salt as much to make the food taste like they wanted it to taste.

So in essence, they learned a different way to "taste" the food. Here's an interesting piece. Lemon and sodium reduction. You can see that in these recipes vegetables, some meats, were added with lemon juice and zest. They were seasoned with that. And the need for sodium for people to enjoy them reduced quite markedly.

It is going to be less as you get to meats with umami, because as we said, umami enjoys some sodium content rather than acid. So the effects diminish a little bit, but still can be quite impressive, up to 30 and 50%.

So, many of you were good enough to answer the questions, and I thought I would let you know if you were right or not. It looks like we had an awful lot of right answers there. So it

is China, which is soy, sesame, ginger and garlic. Chili powder, cumin garlic and lime is Mexico. Paprika, lemon and saffron is Spain. Basil, garlic, black pepper, and tomato is of course Italy. And white wine, meat and truffles is France.

My point in doing this was most -- I see very few wrong answers here, but most everybody knew what these were. All that means is that when you understand these little sets of flavor pairings, it's really easy to make things taste like people expect them to. That's one of the most important things we can do with foods and flavors, is create an expectation and fulfill that expectation.

That's kind of just a little exercise to do that. But everybody did great with that info. Thanks for partaking. Key strategy No. 9 is choosing delicious foods to excite and enhance. We have tons of really cool ways to replace salt when we make food. Fresh herbs. Aromatics like garlic and ginger and leeks and things like that's that have such delicious flavors. And umami, if you're wondering, I'll get to that in a second. Acids, lemons, oranges, limes.

That's what people are buying. They're buying flavor. For the most part, they're not buying health. They're not buying lower sodium. They're buying something that is there.

So we talk about what's delicious, what looks good, what's a good part of this, and advertise it that way. And then the Maillard effect with browning helped a lot. And then of course presentation.

So umami, first discovered if you will, or quantified, by a Japanese scientist Kikunae Ikeda. He was after this taste and at the same time in France Eskofea was in the process of developing meat essences. And peace essences are really about Umami. You may have seen that bone broth is coming to popularity in some of the health ingredients. And you don't need a lot of salt put in it. That is umami. And you don't need to put a lot of salt in.

But anyway, the Japanese scientist quantified this and brought the studies of that to fruition. Where so many people -- there's a whole society based on researching umami and appreciating umami in Japan. And some of the foods that have this are, as you see here, the seafoods and seaweed. There's many vegetables that carry this. So cooked potatoes and shiitake mushrooms. Aged cheeses, grapefruit also carry this umami profile.

So a bit about umami and how it works. In taste testings there were studies done on salad dressings, stir fried pork and soups. They were able to remove quite a bit of salt and maintain the same liking for each types of these likings when they used soy sauce there. So interesting piece. Soy sauce is one of the strongest umami carriers. It really is about glutamates and quantifiably enhances the salt taste about 30%. While many fermented foods are high in sodium, they are useful in reducing salt in the U.S. diet in a number of ways.

Fermented foods and sodium. It's interesting. Fermentation increases aromatic compounds, and you develop umami there as well. And it's ready in many ready to use forms, whether it be miso or fish sauce or soy and all types of pickles, they can all be useful in different ways in adding flavor and satiety to dishes.

Sodium content of national brands of cheese pizza were measured. So here what we have is 376, 692 grams of sodium. Milligrams per 100 grams of food.

The average is 575, and then the salt reduction initiative was 390. How that worked was pizza is a great target to use because it's full of umami already. It has as we know, tomatoes and cheese and yeast in the dough. And of course it has the Maillard effect, the caramelization. And usually very high in sodium. The perfect place to start to pull out salt and see what we can do.

These flavors, whether fish sauce or black garlic or Koji extract, did not become part of the profile. All they did was replace salt that was removed. So they were being tested to see if

they could increase the liking, or maintain the liking as salt was removed, and indeed they did. Miso was used in the dough instead of some of the salt and yeast extract was used in the dough, as was dried soy sauce.

But ultimately you can see there was some relatively marked drops of sodium in this pizza experiment.

So as we wrap it up, I just wanted you to take away a couple things. Flavor is very complex, but there's some really simple contributors. Those are freshness, good cooking techniques, fermented ingredients are great for flavor. Herbs and spices are essential. Aromatics that sometimes by themselves you almost wouldn't want to eat them, but they have big flavor and can carry those through their dishes. Caramelization is a critical tool. And sensorial attributes. Remember, it smells like, it sounds like, et cetera and we'll be able to put forward things that are much more successful. Thank you for listening. I hope that was helpful. And I appreciate people taking the time.

>> Kelly Hughes: Brad, thank you so much for that presentation. Wow! There was a ton of helpful information and I'm sure we'll get questions from the audience. Just a reminder, you can submit questions to all the panelists at any time. I think we have a couple coming in.

Heterocyclic amines get created by browning animal protein and are known to be carcinogenic. Brad, I think this question is for you.

>> Brad Barnes: Yeah, and typically what I've seen and what the research kind of says is that when those are present in foods, it's generally overbrowning, almost to a burnt state that starts to maybe become carcinogenic. And it takes an awful lot of that to occur.

What typically helps that from happening is to brown those proteins in the right way at the right temperature so that they brown very slowly and the sugars caramelize and they don't burn.

But certainly a good point, and that comes down to good technique.

>> Kelly Hughes: Thanks, Brad. I have a question for you too while on the topic of herbs. From your perspective, which would be the most cost-effective, stable, versatile herbs you would suggest starting with for reducing sodium in dishes?

>> Brad Barnes: The best easiest things and most versatile, which is a good point, is Italian parsley and chives. Those two things can lend very quiet flavor support to a dish while not really affecting its flavor profile, if you will.

>> Kelly Hughes: Great. OK. We have another question from the audience. Umami are due to glutamates. The glutamates that the general public has is against MSG. How do we address this concern that the public may have?

>> Brad Barnes: I'm not a scientist, but basically MSG is kind of a nonorganic approach and extracted from glutamates and extracted from these sodium compounds. So it doesn't really have much to do with these glutamates that are contained within foods naturally, other than they extract them and that's part of this sort of unnatural compound. But glutamates are held in these foods and I think there are six or seven glutamates that are important to these foods. But a different animal, if you will.

>> Kelly Hughes: For prepared food items such as those served in schools, can sodium content be reduced without affecting preservation.

>> Brad Barnes: For frozen foods, preservation is not typically a factor. And while that is sometimes what happens, is people are creating frozen foods from canned goods. So you buy 50-gallon barrels of tomato sauce, and you use that to make those frozen products, that's when they run into issues. Generally, that's where way up the food chain, we could look at making changes, because if something's going to be used for prepared foods, potentially it could be

prepared differently if it was going to be frozen than if it was going to have to be shelf-stable.

I'm not going to pretend to be an expert in manufacturing, but I think that's the kinds of questions we would want to address. But it would be compounding. Get rid of the compounding process things. So get rid of what it is before it gets turned into that frozen lasagna.

>> Kelly Hughes: Thank you. There was a question, comment, suggestion from an audience member. I believe this may have been for Amanda. Have you considered giving training for nursing homes to have lowered sodium menus. So this sounds a little bit of like a call of action to reducing sodium in assisted living and nursing homes.

>> Brad Barnes: I think that's a great idea, and truthfully we have about four assisted living companies that we typically do work with on an annual basis. That's a great idea and that's why I applauded Amanda's work there for getting training for those folks, because that brings a whole new communication platform and the ability to immediately understand from a peer how to do it differently. That was super stuff.

>> Amanda Wagner: One thing I will say is I forgot to mention, that for many of the owners, that was one of the first formal trainings that had had in their careers. A lot of them had not had official trainings. So that in and of itself was an incentive and benefit for participating for the restaurant owners. A piece of what we're working on in the Health Department in Philadelphia is we just passed and are working to implement city-wide nutrition standards as well. So that's all the departments that prepare, serve, or sell food. Helping them see where they fall in relation to these standards and then working with them on training and menu and contract review to come more in line with healthier nutrition standards.

So some of those departments include facilities that serve seniors and elderly care. So we're starting that process now as well.

>> Kelly Hughes: Thank you so much to both of you. Are fermented foods such as sauerkraut high in sodium because of what's selected to extract?

>> Brad Barnes: There's a few ways to make sauerkraut and there's of course varying levels of sodium in each of those. However, the interesting piece is that again, this is the power of pairing umami and sodium. So cabbage that's fermented has a relatively high level of umami. Things like doing a quick rings of a sauerkraut. There's a high level of umami left, that remains, even though you got rid of 10 or 15% of the salt. But yes, salts is a critical ingredient for most of these fermented products.

>> Kelly Hughes: We don't have any more questions. So I just wanted to see if Brad or Amanda if you have anything else to share with the audience before we wrap up. No pressure. Just an opportunity.

>> Brad Barnes: I'm good here.

>> Amanda Wagner: Yeah, I'm good.

>> Kelly Hughes: Well thank you so much to both of you for your thoughtful presentations today. We want to thank our audience for participating in today's webinar as well. As well as to CDC for their support in this webinar series. There are several people behind the scenes that have helped NPHI and Dialogue4Health supporting these webinar series. We have Chris Kinabrew as well as Josh Jennings who is a programming consultant with NNPHI and then Star and Holly and Joanna. Please take the survey as you will help shape further webinars. Please stay tuned for our next webinar in July. Information is going to be able on the Dialogue4Health website. Thank you so much, everyone.

>> Brad Barnes: Thanks everybody.

>> Amanda Wagner: Thank you.