UNITED STATES OF AMERICA

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DEPARTMENT OF AGRICULTURE
AND
DEPARTMENT OF HEALTH AND HUMAN SERVICES

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DIETARY GUIDELINES ADVISORY COMMITTEE

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FIFTH MEETING

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WEDNESDAY, APRIL 14, 2010

The meeting came to order at 9:00 a.m. via webcast, Dr. Linda Van Horn, Chairperson, presiding.

MEMBERS PRESENT:

LINDA VAN HORN, PhD, RD, LD, CHAIR
NAOMI K. FUKAGAWA, MD, PhD, VICE CHAIR
CHERYL ACHTERBERG, PhD
LAWRENCE J. APPEL, MD, MPH
ROGER A. CLEMENS, DrPH
MIRIAM E. NELSON, PhD
SHARON M. NICKOLS-RICHARDSON, PhD, RD
THOMAS A. PEARSON, MD, PhD, MPH
RAFAEL PEREZ-ESCAMILLA, PhD
XAVIER PI-SUNYER, MD, MPH
ERIC B. RIMM, ScD
JOANNE L. SLAVIN, PhD, RD
CHRISTINE L. WILLIAMS, MD, MPH

ALSO PRESENT:

SHANTHY BOWMAN, PhD, ARS, USDA
CAROLE DAVIS, MS, RD, CNPP, USDA
KATHRYN McMURRY, MS, ODPHP, HHS
HOLLY McPEAK, MS, ODPHP, HHS
RADM PENELOPE SLADE-SAWYER, PT, MSW, ODPHP, HHS
ROBERT POST, PhD, CNPP, USDA
WENDY BRAUND, MD, MPH, MSEd, ODPHP, HHS

T-A-B-L-E O-F C-O-N-T-E-N-T-S

P-R-O-C-E-E-D-I-N-G-S

9:00 a.m.

DR. VAN HORN: Good morning, everyone. I'm Linda Van Horn, chair of the Dietary Guidelines Advisory Committee. Welcome back for the second day of our deliberations.

We apologize for some technical difficulties that occurred yesterday afternoon, and we're happy to tell you that we will pick up from where we left off.

Yesterday we heard from the carbohydrates and protein, fatty acids, and energy balance and weight management subcommittees. And today we'll start with the completion of the energy balance and weight management subcommittee report from Dr. Pi-Sunyer, and then hear from the remaining four subcommittees on updates on their work regarding the dietary patterns, the new total diet chapter and a brief overview on the translation/integration chapter that we are

planning for this report.

I would like to reiterate that everything being presented today is still in draft form. As a Committee we need to come to an agreement on all conclusions, if possible. And so, there are several issues that remain tentative at this point.

I would like to remind each Committee member to announce themselves whenever they speak so that we all know who is who, although we on the Committee have become very familiar with each other's voices.

We look forward to a rousing day, and I would like to begin by introducing Dr. Pi- Sunyer who will take us back to where we were with the energy balance report.

Xav?

DR. PI-SUNYER: Okay. Thank you, Linda. I'm sorry about yesterday's technical problems, and I will begin here with the effect of weight loss in older adults on health outcomes. And the research question

that we asked was for older adults, age greater than 65 years, what is the effect of weight loss versus weight maintenance on selected health outcomes: cardiovascular disease, type 2 diabetes, cancer and mortality.

The question was not addressed in the 2005 Dietary Guidelines Advisory Report, and we felt it was a question that needed investigation. We did an NEL search. We went back to 1995 and we included older adult studies, people above 65 years of age and looked at health outcomes; cardiovascular disease, diabetes, cancer and mortality.

Next slide, please? So, the proposed conclusion that I had when we prepared these slides last week was a Grade II evidence base. And in older adults mortality associated with BMI is U-shaped, increasing below 18.5 and also rising beginning at 27 to 34, depending on the study. Weight loss in older adults is associated with an increased

risk of mortality. Most studies have not differentiated between intentional versus unintentional weight loss, so no conclusion can be reached on this.

Weight maintenance is associated with a lower risk of mortality, while weight gain produces increased risk. There are insufficient data regarding the risk of developing diabetes, cardiovascular disease or cancer to come to any conclusions.

Now since yesterday, Larry sent me an article that came out just a couple of days ago in the Journal of Gerontology from the ADAPT study, which did a randomized controlled trial with an 18-month weight loss, and the intervention group lost 4.8 kilograms and the usual care group lost 1.4 kilograms. And they were followed for seven years and the group that lost the weight had a much lower event rate for mortality, so the mortality was about half in the group that was intervened. So, this seems like a very good study. It was

well carried out, not a whole lot of people, 318 people.

And there is one other study by Locher in 2007 that also compared intentional and unintentional weight loss. They're the only two that we could find from 1995 on that had separated intentional from non-intentional weight loss.

So, I think we probably should change this and say that there's certainly no risk and there probably is an advantage to losing weight after age 65. So, we can talk about that.

Let me just go onto the next slide. Next slide, please? What we looked at were 35 articles; 32 cohort studies, two longitudinal observational studies. And this one by Shay et al makes three longitudinal -- well, not observations; it's an intervention study. And you can see 10 were positive, 24 were neutral and none were negative.

Next slide, please? If you look

at the data, you can see the mortality on the third column, and throughout the mortality is higher in the groups that lose weight. But as I mentioned, this does not necessarily translate to a higher event rate for cardiovascular disease or diabetes.

If you go to the next slide, please, you'll see again a whole series of prospective cohort studies showing an increased mortality in people who lose weight. And the next one, please? Again, here increased mortality with people who lose weight. I again emphasize that this does not separate intentional from non-intentional weight loss. The only one that does is the Locher in 2007, and when they did -- although they got overall an association between weight loss and mortality, when they separated out intentional from unintentional weight loss, the intentional weight loss people did not have a higher mortality than the usual care group.

Next slide, please. We did have research recommendations relating to this that we think randomized Controlled trials need to be done on the effect of intentional weight loss on the development of diabetes, cardiovascular disease and cancer in the elderly. And also intervention studies that are long enough to give you data on mortality. We now have two data on mortality. We only have a handful of not very good studies on morbidity.

So, what I had put here originally was the proposed implication was the maintenance of weight seems the prudent advice for elderly patients. Since the majority of the studies available have not differentiated between intentional versus unintentional weight loss, preventing weight loss is reasonable. Weight gain, however, should also be prevented.

I think we could now change it since we have two studies that are good

studies suggesting that intentional weight loss actually decreases mortality. I think we can be stronger about saying that it's okay for 65 year olds and over to lose weight and maintain that weight loss over time.

So, I think I will rewrite this and send it around for people to look at.

Next slide. So, these are the overall questions that we asked, and we're open for discussion, I think.

DR. NELSON: Xav, this is Mim.

DR. PI-SUNYER: Yes?

DR. NELSON: The older adult question I think is a really good addition to all of this. I agree with your revisions, but I might also just clarify it a little bit. If there is evidence that it would be that weight loss is beneficial for older adults, was there any evidence that those in the most recent study that they were at risk, you know, like they had BMIs over 25, or had cardiovascular/CVD, type 2 diabetes risk?

Because I'm not sure that ideal body weight people older adults should be losing weight. That's the only thing.

DR. PI-SUNYER: Oh, no. No, I neglected to mention that. These studies with intentional weight loss were of people who had higher weights.

DR. NELSON: Right. Yes, so I think that --

DR. PI-SUNYER: You know, there is this caveat that mortality is low over a wide range in older people. It goes up to --

DR. NELSON: Yes.

DR. PI-SUNYER: -- depending on the study from BMI of 27 --

DR. NELSON: Yes.

DR. PI-SUNYER: -- all the way up to BMI of 34.

DR. NELSON: Yes.

DR. PI-SUNYER: So, you've got a much wider range where mortality is pretty flat from --

DR. NELSON: Right.

DR. PI-SUNYER: -- about 18½ all the way up to 30 probably.

DR. NELSON: But, yes --

DR. PI-SUNYER: So, it really should be people who are probably no lower than BMI of 27.

DR. NELSON: Yes, I would add that to that piece, because I don't think you want --

DR. PI-SUNYER: Yes, that's --

DR. -- ideal body weight folks losing.

And then the only other comment I had was, you know, way back in the early part of your discussion there was one research question which at this point I'm not even sure that I would do much with it because you only had two cross-sectional studies. It was on optimal macronutrient proportions. That question, it seems like you in a sense answered that question more directly when you

looked at the different sub-components later on and there was more evidence, the question as it was stated.

DR. PI-SUNYER: Right.

DR. NELSON: I'm not even sure I would do much with that. So, that's all.

DR. PI-SUNYER: Okay.

DR. APPEL: This is Larry. I was actually going to propose that it be dropped.

DR. NELSON: I think it should be dropped.

DR. APPEL: I mean, other times --

DR. PI-SUNYER: Yes, there are only two cross-sectional studies, so --

DR. NELSON: And I think you get at it with the other questions.

DR. PI-SUNYER: Yes.

DR. NELSON: I just would drop it.

DR. PI-SUNYER: Okay. I think that's a good point.

DR. APPEL: This is Larry. I had a question, and it might be that it's covered

in the chapter, but it seems to me that your chapter sort of begs the issue of where calories come from. So, are you going to have in your chapter sort of like a prominent display of sort of like sources of calories, you know, by age group, gender, the other variables? Because I think that sort of like underlies a lot of the questions you have.

DR. PI-SUNYER: What do you mean where calories come from?

DR. APPEL: Yes, sources.

DR. PI-SUNYER: You mean what foods?

DR. APPEL: Yes, like are they coming from sugar-sweetened beverages or sweets? Because I think in the section on energy balance people are going to say sort of like, well, what are the foods that account for the most calories and to just display that. Because I think particularly for sugar-sweetened beverages, you know, my recollection is that it's much higher in young

individuals and that it really wanes over time. So, that's not as much as an issue with like older adults.

DR. PI-SUNYER: Right.

DR. WILLIAMS: Larry, this is Christine and I'm in the process of preparing those types of charts and graphs for children.

DR. PI-SUNYER: So, I think we should have that. We did not have it in the chapter, but I think we can add it. I'll work with staff on trying to get such a table made up.

DR. NELSON: Yes, this is Mim. We've spoken about this, that there needs to be sort of one central place for the whole report, because it sets up the whole report, understanding where the calories are coming from. And the other pieces for the behavior and the environment section, there really is a fairly robust section on how things have changed for the last 35 years or so in terms of where people eat and what their eating and

portion sizes and number of items that are for sale, sort of, if you will, the whole food environment. And I think it could be that that section on then what we're actually eating now could be there so that it's the whole picture. So, I think we need sort of one place that's central so we're not having to piece it all over the place.

DR. VAN HORN: Yes, Mim, this is Linda and I'm so glad that this topic came up because this is becoming an issue. I do have a feeling that this chapter might be the best place for the contributions of various foods and food groups to the caloric intake, whereas the chapter that you're discussing is more of the behaviors related to that.

But the point I was going to make, and Christine raised it with the children and where their sources of calories are, and of course how appalling it is that up to 40 percent of them are coming from snacks and desserts, as we mentioned yesterday.

In this age group, being somewhat familiar with the post-menopausal women and that age group and their dietary needs, recognizing how few calories most older individuals who are sedentary really need is often sort of shocking to people when they realize that they're sort of like children in the sense that their energy needs are fewer. And therefore, their choices of foods are really even more important from a qualitative sense because they really have so few calories really to work with without gaining weight.

So, as we've said before, we recognize that this report is just so huge that there will be people who cannot possibly read the whole thing. And that in this chapter called Energy Balance, et cetera, you know, it may be the best place to deposit that kind of information so that there is one central location for understanding energy intake so we better understand the energy balance and the needs surrounding that.

But, if others have other thoughts about that, I'd love to hear what you think.

DR. NELSON: This is Mim. I like the idea of having it more centralized so that it's easier for people to see, you know, for children, adults, older adults, gender, and we'll have to be selective. But, you know, some of the data that we've all been presented at these meetings is pretty sobering.

DR. VAN HORN: Right.

DR. PI-SUNYER: Yes, well, I think it would fit in well in the energy balance Committee.

DR. NELSON: Yes, I do think --

DR. PI-SUNYER: And we certainly can work on that.

DR. VAN HORN: Maybe, Christine, while you're working on your version, perhaps that model could be the same we used for other segments of the population, so we have a more unified presentation.

DR. WILLIAMS: I think that's a

good idea.

DR. VAN HORN: You know, a standard format, but involving all different age groups and genders, et cetera.

DR. VAN HORN: Maybe the staff could help us with that.

DR. PI-SUNYER: I think that's a good idea, Linda.

DR. VAN HORN: Okay. Great. Other comments? This has been really excellent. This is probably where the heart beats of this whole report, given our energy and obesity problem.

DR. APPEL: This is Larry. There is one other major trial on weight loss in the elderly where it wasn't powered for clinical outcomes, but there was no adverse signal, and that's the Tone study.

DR. PI-SUNYER: Yes, well, the DPP also showed good effect, and so did the Look AHEAD trial. That was in diabetics, but not mortality.

DR. APPEL: Yes.

DR. PI-SUNYER: They haven't looked at mortality yet. It was only morbidity.

DR. APPEL: Do they have events in those studies though?

DR. PI-SUNYER: They have events, but they haven't gone long enough to really publish them yet. So, we don't have outcomes. We just have risk factors.

DR. APPEL: I see.

DR. NELSON: But in the DPP, I mean, they showed a reduced incidence of --

DR. PI-SUNYER: Diabetes.

DR. NELSON: -- diabetes, so --

DR. PI-SUNYER: No mortality data.

DR. NELSON: Right.

DR. APPEL: I think the Tone study showed that weight loss controls blood pressure, and DPP says that intentional weight loss can prevent diabetes. We just don't have clinical outcomes.

DR. PI-SUNYER: Right.

DR. NELSON: Those aren't bad things to try to modify.

DR. FUKAGAWA: This is Naomi. The other thing though that we do have to consider is perhaps a few words about the kinds of diets that older individuals --

DR. PI-SUNYER: Older people?

DR. FUKAGAWA: -- use to try in the weight loss, because, you know, all sort of weight reduction diets aren't the same. And if we're going to recommend just decrease in calories, that's one thing, but if one starts going out to the market with, you know, the numerous variations on weight reduction-type diets, then we could have --

DR. PI-SUNYER: Yes, I think it's important to make sure they have high-quality protein and enough protein particularly in elderly people.

DR. FUKAGAWA: Right.

DR. RIMM: This is Eric. The

other thing that many studies now tabulate and show is that the best kind of diets for weight loss are those where people actually adhere to the diet. Frank showed that, I think the study from Tufts showed that, that regardless of the diet you were on, that if you adhere to it and were conscious to it, people lost weight. I don't know if that's something you can put into a Dietary Guideline, but spoke to the fact that being mindful of what you're eating was as important as what you were eating.

DR. VAN HORN: Yes, I think Xav did a great job of that yesterday in talking about the different studies with the POUNDS LOST study being one of them, demonstrating quite clearly that, you know, it's really not about high protein or low carb, or whatever. It's about calories and --

DR. RIMM: Right. So, I don't know if we can just say something in the chapter to the fact that adhering to the diet

is important. So, finding a diet that you could adhere to probably has importance.

DR. VAN HORN: Exactly.

DR. PI-SUNYER: Right.

DR. VAN HORN: But I do think --

DR. PI-SUNYER: I think that's the message.

DR. VAN HORN: And the message about the high-quality protein that Joanne raised yesterday and I believe we'll probably raise again.

DR. RIMM: Yes, I agree. I think that's very important.

DR. VAN HORN: Okay. Anything else to be said about energy balance and weight loss, et cetera? This is a meaty chapter.

(No audible response.)

DR. VAN HORN: All right. Well, thank you, Xav.

DR. PI-SUNYER: Okay.

DR. VAN HORN: And we appreciate

everybody's patience as we started off today with finishing up from yesterday, but that was excellent.

And now I think we're ready to move ahead to the chapter on nutrient adequacy, and the chair for that is Shelly Nickols-Richardson.

Shelly, are you on? I noticed that you had been disconnected. Are you there?

DR. NICKOLS-RICHARDSON: I am. I'm back.

DR. VAN HORN: Oh, great. Okay.

DR. NICKOLS-RICHARDSON: Okay. Well, thank you, Linda, and it's a pleasure to be able to present information related to nutrient adequacy. And we do have quite a bit of information to present, so we'll just jump right in here.

The members of the subcommittee include Naomi Fukagawa, Cheryl Achterberg, Joanne Slavin and Miriam Nelson. And I do

also want to take time to recognize the brilliant work of our CNPP liaisons Trish Britten and Eve Essery, as well as Rachel Hayes with HHS. In addition to that, Joan Lyon with the NEL staff and Shanthy Bowman at ARS who have been just very instrumental in making sure that we've had all the data that we needed to review and look at.

We have six topic areas for which we're pulling information. Some of these new to the 2010 report. There are eight questions that we're addressing and a few sub-questions within those eight key questions.

We've already presented and talked about some of these questions at previous meetings, so today we'll just focus on what hasn't been presented yet. And then at the end of this section, we do have two modeling questions to present that will actually be incorporated into the total diet chapter, but because the nutrient adequacy subcommittee has been working on those, then we'll present them

as part of this today.

So, this slide lists sort of three of our topical areas. Questions 1 and 2 are new to the 2010 report, so we'll talk about those here with some detail in just a few minutes.

The next slide shows one of our topical areas and some sub-questions related to nutrient issues for selected population groups.

Next slide are the final topic areas. Nutrient supplements are new to this report, as well as some of the selected behaviors.

So, jumping right into this, I want to first start with a couple of topics related to how we proceed with coming at nutrient adequacy from a food standpoint and looking at how we select foods and view foods in relation to the nutrients that they provide.

So, one of the questions that has

been discussed is this concept of nutrient-dense and do we continue to use nutrient-dense in the --

DR. RIMM: Shelly, I think we're losing you. Do you mind moving closer to the phone?

DR. NICKOLS-RICHARDSON: -- so, being able to use nutrient-dense and to continue with nutrient-dense as part of the 2010 report and the work that we do.

Some of the pros of continuing with nutrient-dense include that the concept is theoretically valid. We believe that it's generally accepted and well-understood by nutrition professionals in particular, that it does emphasize foods and distinguishes nutrients from the energy that's contained in food. We also believe that this can be applied to help assist consumers in making food choices that meet nutrient needs within fixed calorie levels or within fixed energy ranges.

Some of the cons related to this is that when we look at nutrient density there are different ways of calculating nutrient density for foods and for total diets, different variety of ways of doing that. And some of those ways are listed here, whether it's the ratio or trying to avoid nutrients that should not be consumed in quantities larger than what's recommended such as cholesterol or saturated fats, for example. Adjustments for water and fat content and what that does to the nutrient density of a food. And then nutrient fortification and how do we handle fortification of foods.

Nutrient-dense may or may not also encompass nutrient-rich, nutrient density or nutrient- to-energy ratio, and these can be looked at as separate concepts. We're not real sure what the contrast truly is. Is it non-nutrient- dense, is it nutrient-poor or is it energy density or energy-dense foods. So again, these are some of the questions and

cons related to using nutrient-dense that we've discussed and debated a little bit.

And then just the concern over whether naturally nutrient-rich foods are equal to or superior to foods that have been fortified with nutrients.

So, in discussions and in thinking about this within the subcommittee and opening this to the broader Advisory Committee, the consensus is that we do continue to use nutrient-dense. This was defined in 2005 by the Advisory Committee as those foods that provide substantial amounts of nutrients and relatively few calories.

And so, what this means in translation and really trying to use this as a definition that can be translatable, what we're really talking about and focusing on then are forms of foods that are lean or low in solid fats and without added solid fat, sugar, starches or sodium and that do retain naturally occurring components such as fiber.

So, what this means then -- and we can go ahead to the next slide there. Actually this slide, Trish. Just as examples what this means is that all vegetables, fruits, whole grains, fish, eggs and that that are prepared without added solid fats or sugars are considered nutrient-dense, again in lean low- fat forms, again not prepared with solid fats or added sugars.

So, using this as our operational sort of working definition here, we're not advocating for a specific calculation to identify nutrient density of foods, because we're not wanting to pit apples and oranges against each other, which would have different nutrient density numbers or ratings, if you will, but we're wanting people to incorporate all of those wide range of foods, particularly vegetables, fruits, whole grains, foods that can be included in a total diet that are nutrient-dense.

So, we're also looking at

nutrient-dense foods being in a variety of forms, so this includes intact foods or whole foods, if you will, sliced, cooked, minimally-processed. So again, all the variety of forms that foods can be included and can be nutrient-dense foods.

And then consuming nutrient-dense foods of lower energy density. And rather than sort of trying to take foods that are not normally nutrient-dense and putting nutrients into those through fortification or enrichment, or making food-like substances that have a lot of nutrients in them, we're talking about those foods then that already have naturally- occurring components of nutrients and fiber and so on.

So, to move forward with this, using nutrient-dense sort of in this operational definition as it exists in the previous slide.

I'm going to move now to sort of a second question that we've had related to

definitions and talk about discretionary calories. And after discretionary calories, I'll stop for a minute and see if there are questions related to nutrient-dense and discretionary calories.

So again, one of our questions related to just how we approach foods, how we approach energy in the diet, a question came up about should we continue to use the discretionary calories concept in the 2010 Dietary Guidelines?

And in our discussions and deliberations some of the pros for doing that -- and next slide -- is that discretionary calories is still a theoretically valid concept. In 2005, this was operationalized as calories from solid fats, added sugars and alcohol. And that was successfully used in the 2005 Dietary Guidelines. That has been translated and transformed into assessments, including the Healthy Eating Index 2005, which included solid fats, alcohol and added sugars

as components of looking at the diet quality. And of course, these were sort of negative indicators of diet quality. But nonetheless, it has been used to be able to take a look at diets and the quality of those diets.

From a consumer standpoint, it has been expressed as calories from extras and has somewhat successfully been used in -- some of the cons related to discretionary calories is that it is a difficult concept for the average consumer to understand. Even for nutrition educators it's been somewhat hard to translate that into a useable definition. The setting of a discretionary calorie allowance sort of gives this suggestion that there is an amount of discretionary calories that are needed, and that's not the case. These are non-essential nutrient-based calories, and we really don't need these calories in the diet, so trying got move away from sort of an allowance to a suggestion.

The other issue is that SoFAAS are

not necessarily discreet entities, and so it's hard to figure out for some how to count discretionary calories as they're embedded in foods.

We know that SoFAAS consumption is about a third of all calories consumed, and so to focus on solid fats and added sugars; and we'll discuss a little bit more of this when we move into components over-consumed, trying to make sure that we're not trading off these particular calories that come from solid fats, added sugars, alcohol for refined grains or starches, or other components that might be added to the diet then if these are decreased. And then finally, there's not a great body of evidence suggesting that discretionary calories has been helpful. There is some consumer research that's ongoing, but it's not very clear how well and how useable discretionary calories is for the public.

So, our consensus here is that even though we can model and use modeling to

determine maximum amounts of calories from non-essential nutrients sources that can be consumed here, we're really trying to help Americans avoid some of these additional calories, or these calories that count as discretionary calories.

So, moving away from the use of discretionary calories and then really focusing on solid fats and added sugars. And I'll provide the rationale for why we're not focusing on alcohol when we get to the components over consumed.

So, I'll stop here for a second and see if there are any questions, comments, further discussion related to nutrient-dense and discretionary calories, keeping in mind that we'll move forward with the use of nutrient- dense and promoting nutrient-dense foods and forms of foods, and moving away from discretionary calories then and focusing on trying to decrease solid fats and added sugars in the American diet.

Questions or comments?

DR. NELSON: Shelly, it's Mim. I just have a quick question. I think, excellent -- I like this direction. Somewhere I do think we have to have, when we're talking about nutrient-dense, a sentence, all the stuff that you talked about, but also just sort of usually in its most natural state. Something about that. I think that gets at the sort of less-processed, less-concocted foods that may just have added vitamins and minerals.

DR. NICKOLS-RICHARDSON: Good point.

DR. NELSON: But otherwise, I think it's excellent.

DR. PEARSON: Shelly, this is Tom Pearson. Can you hear me?

DR. NICKOLS-RICHARDSON: I can. Go ahead.

DR. PEARSON: Sorry, I've had trouble with my phone. The non-solid fats

have never been part of this discussion because of the essential fatty acid and fat soluble vitamin issues, is that correct?

DR. NICKOLS-RICHARDSON: Correct, and we'll actually address oils in the food groups and dietary components.

DR. PEARSON: Right. But obviously they have a caloric density per gram, but obviously they have more nutrients that are found only in them. So, that was my question. Thanks.

DR. NICKOLS-RICHARDSON: Yes.

DR. SLAVIN: This is Joanne. Tom, I'd like to follow up on that, because it's the same issue in carbohydrates that --

DR. PEARSON: Right.

DR. SLAVIN: -- you know, we worry about that and say, okay, added sugar is what we're going to focus on, then starches and other carbohydrates, you know, that have equally no real difference in health benefits, kind of drop off here.

DR. APPEL: This is Larry. This is very reasonable. I hope that in the chapter you mention that the concept is valid and that this represents a refinement. I mean, it's been the basis for many deliberations and it shouldn't be just dropped as a concept, the discretionary calories concept.

DR. VAN HORN: I think, you know, just to summarize for those listening, because we all have spent so much time talking about this that others have not heard us do that, I think the point to be made here, and Shelly mentioned it, but just to reiterate, scientifically it makes total sense. Practically it's very confusing. Therefore, I think the whole point of what constitutes energy density versus nutrient density is a message that needs to come out more clearly to the American public so that instead of that 40 percent of calories coming from nutrient-poor energy-dense foods, they actually recognize

there's a way to get calories that are more nutrient-dense.

And, yes, to add to the point that was just made by Joanne and others, you know, this does not necessarily require fortification of functional foods as much as it does choosing whole foods that are --

DR. NICKOLS-RICHARDSON: And I'm making a note to myself and certainly if we refine the chapter, we'll make sure that these comments are incorporated into that.

DR. VAN HORN: Right.

DR. NICKOLS-RICHARDSON: And then I think, yes, there will be much work related to the translation of this for the consumer messages and for the final Dietary Guidelines that come from the Advisory Committee's recommendations.

DR. PEREZ-ESCAMILLA: Larry, this is Rafael Perez-Escamilla, and I guess my question is why do you consider that discretionary calories is a valid scientific

construct?

DR. APPEL: Well, I mean, actually Shelly agreed to it, too. I mean, it's a way to indicate the difference. And this is of course very difficult to explain, the difference in total calories that somebody consumes and the total calories that are needed to provide the nutrients and meet our guidelines. And it's a tough concept to describe, but I think it's valid. And that in order to meet your nutrient requirements, given the physical activity that most people have, there are next to no discretionary calories. But it's an equation, and it's hard to describe.

DR. PI-SUNYER: This is Xavier. I think it's extremely hard --

DR. APPEL: Yes, I mean, I --

DR. PI-SUNYER: -- for people to understand.

DR. RIMM: Yes, this is Eric. I think there's two different things that all of

us agree that it is hard to understand. And I think from Larry's standpoint he was using it because he wanted to, you know, construct diets for trials, and so it was an easier way to come up with a calculation or an equation so you could construct something that fit, I guess, within this construct. But everybody on the Committee I think kind of struggles with the fact that it's really hard for an individual to use it.

DR. VAN HORN: And I guess I would just add to that. It's almost like what I see so commonly among pregnant women thinking, whoopee, I can eat for two, you know? And the idea of telling somebody you have some discretionary calories, I think unfortunately translates in their mind to, you know, eat up. And I'm afraid that that message somehow just hasn't made it across. And so, the idea of concentrating in this obese environment, the fact that there are very few extra calories that anyone has and that food or indulgence,

one of them, you know, that people enjoy, but not feeling as though there's open reign on energy-dense nutrient-poor foods. And I think that's what this Committee has been struggling with. But we all recognize the value of the concept, so it's the tug and pull between the translation of that versus the essence of that scientifically.

DR. ACHTERBERG: This is Cheryl. If I can weigh in?

DR. VAN HORN: Sure.

DR. ACHTERBERG: I think the easiest way to explain it is that this discretionary calorie concept is in fact a margin, a margin after individuals meet their other nutrient needs in order to meet their calorie needs. But that margin is so thin for most people it in essence is near zero. But for people who are very, very active, they would have a larger margin and then could quote/unquote afford to eat more calories.

DR. SLAVIN: Again discretionary

calories could come from lots of things besides added sugar and solid fat. So I think that's where, when we were just taking about the energy chapter, somewhere in this document we have to have really clear data on calories and foods. That you can take added sugars out and solid fats out and you can still have a high-calorie food. And we need to make sure that point doesn't get lost in this document.

DR. ACHTERBERG: And I think coupled to that, if we go back in history to how did the particular foods in discretionary calories end up there, it's because there was no place else to put them. They don't contribute anything else to the diet, besides calories, that's meaningful.

DR. NICKOLS-RICHARDSON: Okay. Thank you for that discussion, and I think I'll go ahead and move into dietary components over- consumed, because we get into some of the meat here of looking at solid fats and added sugars.

And so again, this is a question that's new to the 2010 Advisory Committee and we really wanted to, again approaching this from a food standpoint, a foods perspective, to try to get a handle on what is it about the American diet that is presenting some concerns in relation to the foods that we eat, to the calories that we eat.

So, a draft conclusion here is that estimated intakes of the following nutrients and dietary components are high enough to be of concern: For adults, this includes total energy intake, particularly energy intake from solid fats and added sugars because we have good data about those contributions to total calories; sodium; percentage of total energy from saturated fats; total cholesterol, primarily only in men, and refined grains. For children, energy intake from solid fats and added sugars; sodium; percentage of total energy from saturated fats; total cholesterol in boys aged

two to 19 years of age; and refined grains.

Where we drew this information is from the National Cancer Institute that used NHANES data, and I do want to acknowledge Sue Krebs- Smith and the fabulous work that they've done at NCI in getting these data together and often responding to a lot of questions that we've had in a very timely manner. Also, the ARS NHANES analyses. I will mention that we also looked at reports from the Supplemental Nutrition Assistance Program, formally known as Food Stamp Program, as well as reports on school lunch and the WIC Program that were prepared by Food and Nutrition Service, and the Institute of Medicine's report on school meals. And just to briefly mention that the data that I'll show you in the next several slides in those reports related to the food assistance programs and school meals is very consistent with what I'm presenting here from the NCI and ARS information.

So, to identify dietary components over- consumed, what we did is take a look at typical intakes and amounts per day in standard units and then compare those to DRIs or limits from the USDA Food Pattern. So again, those model patterns for appropriate eating to meet nutrient needs based on DRIs. And so, we looked at specifically at total energy, energy from solid fats and added sugars, sodium, saturated fats, cholesterol and refined grain.

What we see in terms of total energy intake, and this is mean total energy intake in comparison to recommended ranges. So to orient you to this particular slide, we have on the bottom, the x-axis is our age/sex group. On the y-axis are calories per day. What the bars represent are the high end of the range, which would be for active individuals, and the low end of the range would be sedentary individuals. So, for each sex/age group, we have the range of calories

that is appropriate depending on physical activity level. And then the triangles are the actual mean energy intakes for those age/sex groups.

So, I would point out here that if we look at males and females two to five years of age, mean energy intake is up at the higher end of that range. I think it's safe to say that not all of our two to five-year-old boys and girls are very physically active.

Males and females six to eleven years of age are also at that higher end of mean energy intake.

A little bit better when we get toward the adult population, the adult groups here. But again, I would point out that for overweight men they do tend to underreport intake by about 14 percent. Obese men underreport intake by about 20 percent. Overweight women underreport by about 15 percent, and obese women underreport intake by about 21 percent. And this is compared to

normal weight men who underreport by about one percent, and normal weight women who underreport by about six percent. And that's based on data comparing energy intake to energy expenditure using the doubly-labeled water method.

So, to make that point and again to show here that, particularly in childhood and moving through the years, that we do need to be concerned about energy intake compared to what recommended ranges are in relation to physical activity for the American population.

To look a little bit further into this, and, next slide, now we start to look at what are some of those components then related to energy intake. And again, this information is related to solid fats and added sugars. Alcohol is not included here. And, if we think about solid fats, solid fats are those that are solid at room temperature. It would include saturated fats. Added sugars are those sugars and syrups added to food during

processing or preparation and not sugars that are found naturally in foods such as sugars in milk or fruit, for example.

Alcohol is not included here because generally alcohol has not been included in the reporting of the intake of children and adolescents. And alcohol actually contributes not as much energy intake to the total diet in adults, so the focus here again is on solid fats, added sugars. In the past, the SoFAAS acronym has been used including that additional A for the alcohol. Here again, and when I move through these, we'll focus mostly on just the SoFAS, the truncated solid fats and added sugars. And I'll try to refer to this as solid fats and added sugars rather than SoFAAS to avoid that confusion.

The next several slides will have sort of a similar orientation. So again, what you see here are the age groups, the children, and then females and males are for our adult

age group. Those also include adolescents. So, you'll see across sort of the x-axis here is the age groups. And then across the y axis is the item that we're looking at.

So, here this is in kilocalories per day of solid fats and added sugars.

The yellow bars across all of these graphs then are maximum limits in this particular slide. So, if we look at where that yellow bar is and where our maximum limits for SoFAAS calories -- and again, this is sort of the 2005 discretionary calories limit, then we see that everyone in every age/sex group, with the exception of those over 70 years of age, are above the maximum limit for solid fats and added sugar intake. And I think I should note that one-third of all calories for adults are from SoFAS, that's the median intake, and again that's without alcohol. And greater than 95 percent of the population, except again for those aged 70 and older, consume more than 20 percent of total

calories as SoFAS, again without alcohol.

Next slide. These are mean usual intakes. So, if we look at where those total SoFAS calories are coming from, this breaks it down into added sugars and solid fats. Added sugars in blue, solid fats in the red bar. So again, we see age/sex groups along the x-axis, the kilocalories per day along the y-axis. And I think this speaks to maybe Larry's point from yesterday. If we look at children four to eight and nine to 13 years of age, as well as our adolescent individuals 14 to 18 years of age, I'll just point out males who were 14 to 18 years of age, about 450 kilocalories -- well, actually it's more than that. Males nine to 13 years of age, 450 kilocalories in the diet are coming from added sugars, about 480 on average coming from solid fats.

Next slide. If we look at sodium, the yellow bars are maximum limits. The higher yellow bar represents the upper level. The lower bar represents adequate intake.

So, if we look across all age/sex groups, looking at sodium in milligrams per day, we see that with the exception of a few groups, the older individuals, that really everyone is above the adequate intake for -- well, everyone's above the adequate intake for sodium and some are a little bit under the upper level, but many are over the upper limit of intake. And you'll hear more about that in sodium, potassium and water later this morning.

Next slide. Looking at saturated fats, again the yellow bars are maximum limits, so less than 10 percent of total energy from saturated fats. And again, if we look at children, females and males, we see that about 50 percent of the population are over the limit of less than 10 percent of total calories from saturated fats.

Next slide. Cholesterol is represented here. Our maximum limit is 300 milligrams per day. And children tend to do

okay with this, so really less than five percent go above that recommendation. Females tend to do pretty well here, but males, for the older ages starting at about 14 to 18 years of age and above, about half of males consume more than 300 milligrams of cholesterol per day.

Next slide. If we look at refined grains, again the yellow bars are maximum limits. The higher bar is for active individuals and the grain in ounce equivalent per day that could be consumed for active individuals, the higher yellow bar. For sedentary individuals, which is the lower yellow bar; and just as a frame of reference, in a 2000-calorie diet, this would equate to a six-ounce equivalent per day of total grains. If we look at the distribution here, the percentile distribution, we see that for sedentary individuals that would --

MR. GILBERT: Shelly, I'm sorry to interrupt. This is Nathan. Is it possible

for you to speak louder or closer to the microphone? We're getting some reports that your audio is faint and cutting out.

DR. NICKOLS-RICHARDSON: Still too quiet? Okay. I'll try to speak closer to the phone. Does this help?

MR. GILBERT: It's a little better. Thank you.

DR. NICKOLS-RICHARDSON: Better? Okay. I'll try to do the best I can here.

MR. GILBERT: All right. Thank you.

DR. NICKOLS-RICHARDSON: Okay. So, with refined grains then, if we look at really across-the-board for sedentary individuals, really in all age/sex groups, we're consuming more refined grains that are recommended.

So, the draft implication related to dietary components over-consumed include that, to lower overall energy intake without compromising nutrient intakes Americans should

focus on lowering consumption of calories in the form of solid fats and added sugars. Efforts are warranted to lower total sodium intakes, promote lower intakes of saturated fats and total cholesterol, particularly in males older than 12 years of age, and to lower refined grain intakes and replace refined grain intakes with higher-fiber whole grains.

We do have a research recommendation which includes: develop and test behavior-based interventions designed to lower dietary intakes of nutrients and dietary components over-consumed with particular emphasis and focus on solid fats and added sugars.

I'll stop here and see if there are any questions or comments related to dietary components over-consumed.

DR. PEARSON: Shelly, this is Tom Pearson.

DR. NICKOLS-RICHARDSON: Yes?

DR. PEARSON: This is terrific, a

real tour de force. There's so much to think about.

One question I had, looking at the source of the data, had some period of years from the various sources. Is there any possibility of getting some trend data over say the better part of a decade, in particular relative to one slide you showed of excess fats versus carbohydrate sugars?

DR. NICKOLS-RICHARDSON: That's probably possible.

And, Trish, I know you're out there listening, so can you make a note and we'll see what we can come up with?

DR. PEARSON: Yes, it has to do with again, some of our campaigns for low fat being traded off with carbohydrates without really a caloric implication, or maybe even a bad caloric implication.

DR. NICKOLS-RICHARDSON: Yes.

DR. PEARSON: So, that's the interest.

DR. NICKOLS-RICHARDSON: Okay. Thank you.

DR. NELSON: This is Mim. I think the only question I have is, given the conversation we just had about where -- because you've just presented, actually, a lot of dietary intake data. And I'm wondering if there is any reason -- I just think we need to strategize a little bit about where we put all the intake data. Because what you've just presented is quite a bit of some of the more interesting stuff.

DR. NICKOLS-RICHARDSON: Sure. And I actually -- as to the discussion about where is this information, that's when my phone cut off, so I wasn't able to share that information. And, you know, we're moving along with the drafting of the chapter, but I am very flexible that if this fits better somewhere else and it makes more sense to reinforce points perhaps in energy balance, I think we can take a look at where we want to

have certain types of information.

So again, I think, you know, working as our science writer, as Ann takes a look at the chapters and how things are coming together, putting things where it really makes sense. Obviously, this makes sense to us here because of the food focus and where do our calories and where do our nutrient components come from, but if some of this needs to be shifted, I'm flexible on that.

DR. PEARSON: This is Tom Pearson. Relative to that, I think wherever this goes, this is such a core part that it should be cross- referenced very carefully. So for example, in fatty acids and cholesterol, we have to quote these slides elsewhere in the modules, even in our section. So, I think that's very important that this all get linked together.

DR. NICKOLS-RICHARDSON: Absolutely. And I'm the queen of cross-referencing, so in the draft of the

chapter, I have referenced energy balance, carbohydrates, protein, fatty acids, alcohol. I think maybe the only place I haven't cross-referenced is the food safety, but we will do that when we talk about fish.

DR. FUKAGAWA: Shelly, this is Naomi. That's great, with your presentation.

But just as a point of clarification, the chapter does deal with the issue of the enrichment of refined grains and that we really are not compromising intakes of some of those micronutrients that refined grains are enriched with when we recommend a potential reduction. Correct?

DR. NICKOLS-RICHARDSON: Correct, and I think what we're really talking about is because all of our grains come in the form of refined grains and we're missing dietary fiber by doing that, we do get to, when we talk about folate, the modeling of looking at all grains as whole grains and what that means in terms of nutrient adequacy. So, we're not

suggesting that we push that completely to whole grains, or if we do, that those are fortified products. But, yes, you're correct. We will get to that when we do address that question.

DR. FUKAGAWA: Thanks.

DR. NICKOLS-RICHARDSON: Okay. In the interest of time, I think I'll keep moving along here.

Our next topic is food groups of concern. And again, this is our second topical area, question No. 2. Again, to get an understanding or to gain an understanding of where we missed the mark in nutrient intake, we wanted to take a broader look at the foods that Americans are consuming and what that means then in terms of nutrients.

So again, a new question for 2010. And our draft conclusion here is that reported dietary intakes of the following food groups and dietary components are low enough to be of concern: For adults and children,

this includes vegetables, fruits, whole grains, fluid milk and milk products, and as a dietary component, oils. For adult women and adolescent girls, meat, poultry, fish, eggs, soy products, nuts and seeds as a complete food group. Primarily the focus is on meat, poultry, fish.

The evidence that we looked at again includes National Cancer Institute data in which NHANES were analyzed. We also looked again at the FNS reports and the Institute of Medicine reports, and again the findings from those reports were very consistent with what will be presented related to the NCI data from NHANES analyses.

Our methods here were to look at typical intake in amounts per day or amounts per week in standard units and then compare this again to the USDA Food Patterns for the basic food groups and the modeling that was done of those patterns to meet nutrient intake.

So, specifically we looked at: Vegetables as an overall group in addition to the various subgroups of vegetables; fruits, including total fruits as well as sub-components or subgroups of fruit; grains, including whole grains; fluid milk and milk products; the meat group; and then oils.

Okay. Next slide. And I saw that popped up here. And this is just to remind you that with the USDA Food Patterns, that the range of calories do exist for the different age/sex groups, and so just to look at those ranges of calories because those relate then to the serving for the different food groups.

The next slide, and what you'll see here for the food groups are two slides. This first is more of a table format. A second slide will be presented to you in more of a figure or a graphic form. Really what I want you to focus on is all of the red that appears in these medium intake slides. And what this shows, then, is the food group of

concern. So, what we're looking at for food group, the population group that includes all of those age/sex groups, what the median intake is, what the recommended ranges are across those calorie ranges for those groups, again remembering the lower end is the sedentary, higher end is for active individuals, and then the link to the shortfall nutrients that will be important as we move to nutrients of concern.

So, here with the total vegetables, which does include dry beans and peas, you see all of the red, all of our age/sex groups missed the mark for our recommended intake across calorie ranges, which links to shortfall nutrients such as potassium, dietary fiber, magnesium, several vitamins and then folate of women of childbearing age.

When we look at this based on the percentile data, again to orient you to this slide, on the bottom is the age/sex group.

So, what we're presenting here is just the females and males ages 14 to 18, and then we have a midlife group, females and males ages 31 to 50. This is consistent with the other age/sex group, so we just selected these to sort of give you an idea of what this picture looks like.

So, percentile data. Age/sex group is on the bottom. The recommended goals are the yellow lines, so we'll see our recommended goals for vegetable intake are three cup- equivalents per day of vegetables for females, 3.5 for males. And everyone falls below those targets.

Next slide. If we look at males and females in midlife, with the exception of some males, about five percent of males, again men and women in midlife fall short of meeting the vegetable intake recommendation.

Next slide. Here we move to the vegetable subgroups, and again, if you focus on all of the red, these are places where we

missed the mark. So for dark green and leafy, red, orange, dry beans and peas, potatoes and other starchy vegetables and other vegetables, with the exception of males and females 19 years of age and older, in that other vegetable group, again we're missing our target intake for the different subgroups or subcategories of vegetables. And again, these contribute important nutrients to Americans, and so we're missing the mark for those nutrients.

The next slide moves into fruits. If we look at total fruit intake, the only group that meets target recommended intakes from a median intake standpoint are children two to three years of age. And I should note that that's largely because they do consume fruit juices, 100 percent fruit juices specifically in relation to this. So, but moving into the older age group and by gender, certainly we're missing the mark here. So, these are median intakes. If we look at this

from a percentile intake, again the yellow bar is our target in cup equivalents for fruit. Again, total fruit, for our adolescent boys and girls, most of them are missing the mark for fruit consumption.

Next slide is in midlife. Again, for men and women, missing the target for fruit intake.

Next slide relates to grains. You've already seen information about refined grains being over-consumed, so that's the representation of total grains. And in large part our grain consumption is refined grains and so we do fine with total grains because we're consuming refined grains. But if we look at the recommendation of at least half of grains coming from whole grain sources, then we're missing the mark there. Again, if we think about a 2,000-calorie standard diet, then greater than three ounce-equivalent should come from whole grain, and for all age/sex groups we miss the mark there.

Looking at this from a percentile data standpoint, I think it's very clear here that everyone across-the-board for our adolescent males and females miss that at least three ounce-equivalents. If we look in midlife, again we miss the mark for whole grain consumption.

Moving to milk and milk products, again children two to three years of age do meet target recommendations looking at this from a median intake standpoint. Children four to eight years of age do pretty well also, however, there's some new data from Bailey in 2010 that suggests that the four- to eight- year-olds may have some concern. And then as we move up the age/gender group, we see that again we fall short of recommended intake and the nutrients then that we miss by not consuming from the milk and milk products group.

Looking at this from a percentile intake, again for females, adolescent females,

only about five to eight percent meet recommendations. Boys do a little bit better, about 30 percent of them meeting recommendations, but there's about 70 percent not. If we look in midlife, we see that all women in midlife are not consuming the target. And men do a little bit better, but again a vast majority not meeting target for milk and milk product consumption.

Next slide. Then, the meat and beans group, with the exception of females 19 years of age and older and a little bit of a concern on the lower end for children, then we see that women really from a median intake standpoint are missing the target intake here. Other age and sex groups do fine.

If we look at this from a percentile data standpoint, then here we see a little over 75 percent of our adolescent females fall short of meeting the recommendation in this food group. Boys tend to do a little bit better. But again, about

half the population not meeting that. And then if we look at midlife, again the concern really is for the women with a little over 50 percent not meeting the target for meat intake.

Next slide. If we look at oils, then, as a dietary component, we see that in relation to recommended intakes across those calorie ranges that for all age/sex groups that median intakes are lower than the recommended intakes and the link to the shortfall nutrients, as Tom pointed out, really being essential fatty acids, as well as vitamin E.

Next slide. And then if we look at oil consumption from a percentile intake perspective, again we see for our adolescent individuals that both boys and girls fall short, or the vast majority fall short of that.

And if we look at midlife, then we also see -- next slide. Okay. So, here we

have midlife males and females, and again we see that oil consumption compared to goals falls short of that goal.

So, next slide. In relation to food groups of concern, our draft implication is that efforts are warranted to promote increased intakes of vegetables, especially dark green, red, orange and dry beans and peas, fruits, and whole grains, and substitution of oils for solid fats, regardless of age, increased intakes of fat-free or low-fat fluid milk and milk products by children age four to eighteen years of age, and adult men and women, and increased intakes of lean iron-rich meat, poultry and fish by adult women and adolescent girls. And I want to emphasize the point about substitution of oils for solid fats. We're not encouraging or recommending Americans to simply add oils to the diet, but they should be substituting oils for those solid fat components.

Further implications include intakes of nutrient-dense forms of foods. And again, forms of foods that are lean or low in solid fat and without added solid fat, sugar, starches or sodium from these basic food groups should replace foods in the current American diet that contribute to high intake of solid fats and added sugars and refined grains. Again, not talking about adding additional food, but making better selections from food groups that meet nutrient needs.

Research recommendations include conducting clinical trials in children and adults to critically examine the impact of adherence to the 2010 Dietary Guidelines as these become developed and are published as a total dietary approach to a healthy lifestyle on body weight change, cardiovascular disease, type 2 diabetes, cancer and osteoporosis and related clinical end points.

Further research recommendations include quantitatively and/or qualitatively

investigating how the food environment facilitates or hinders achievement of food groups and dietary component recommendations notably in individuals enrolled in food, assistance programs and/or across various ethnic and cultural groups. And this is largely linked to the food environment information that Mim presented yesterday related to energy balance.

I'll stop here, take time for questions, comments, concerns about food groups of concern.

DR. VAN HORN: Excellent job, Shelly. I think the graphics are so incredibly convicting when you see so many shortfall foods, as well as nutrients. It really sends the message loud and clear as to where we really need to shore up and increase intake, which hopefully will then counterbalance some of the recommendations to reduce sugars and fats.

DR. WILLIAMS: Shelly, this is

Christine. Excellent presentation. I was just thinking, when you look at the food sources of solid fats, for example, for children, pizza, grain desserts, whole milk, regular cheese, fatty meats, some of them, certainly the dairy products would be personal choice that individuals could make, but others we'll need to have industry help us to make some changes in what's available and recommended to the public.

DR. NICKOLS-RICHARDSON: Excellent point.

DR. PEREZ-ESCAMILLA: Shelly, this is Rafael. Excellent presentation. In terms of the nutrient density recommendations, it is very clear that, you know, the fruit intake, but especially the vegetable intake, dark green vegetables, you know, orange, yellow veggies and so on, that consumption is so incredibly low, that I think it fully justifies making a strong statement about increasing nutrient density in the U.S. diet

by dramatically increasing the variety of vegetable intakes that are recommended.

DR. NICKOLS-RICHARDSON: Yes, thank you. And, you know, we say this every time, but the dry beans, peas, you know, that whole category that could enhance the protein intake as well as the dietary fiber intake. You know, there are certain cultures where those foods seem to play a more dominant role, but to increase awareness and access to those foods in easy- to-eat forms, et cetera, would seem to be a great step in the right direction to try to raise awareness and attention to that.

DR. APPEL: This is Larry. I had a question. By the way, it was excellent. I really enjoyed it. Learned a lot.

For the meat and beans group, what really drove the -- under -- was it primarily the iron? because in all honesty I see the link to nutrients of concern, phosphorus and choline, and quite frankly, I don't see those

as public health issues.

DR. NICKOLS-RICHARDSON: Great question. And it really is the iron that was driving this. And actually, as we move into nutrients for selected populations, we'll address the iron and women's reproductive capacity question.

The phosphorus is sort of -- and the choline -- I'll also actually show a couple of slides specifically about choline, phosphorus and how we arrived at really not considering those of great public health implication at this time. The phosphorus is sort of an anomaly. It's really that adolescent population that seems to be missing the mark for intake there, which is somewhat confusing I think to many of us because of phosphorus sources, you know, and the variety of where phosphorus can come from, and our thinking about the foods that adolescent girls do consume.

DR. APPEL: Yes.

DR. NICKOLS-RICHARDSON: So again, we're not looking at phosphorus as a nutrient of great public health significance, but it really was the iron.

DR. APPEL: The reason I bring that up is that, you know, one of your concerns as stated is meat, but really if it's iron, then that seems to be a pretty expensive vehicle for, you know -- it seems that -- and I'm not quite -- you know, I'm a little bit struggling with this. You know, is there a public health concern related to inadequate meat intake? And then consistent with some of the other discussions yesterday, there are ecologic issues when you start, you know, pushing meat intake.

DR. SLAVIN: This is Joanne. I don't think we're pushing. I know being on this Committee it's iron for sure, but also protein quality. So, if we want people to eat fewer calories, especially during growth and development with higher protein needs, protein

quality is a big issue.

DR. PI-SUNYER: And I think what --

DR. ACHTERBERG: And this Cheryl, too.

DR. PI-SUNYER: -- is that maybe there are alternatives to meat that would be better.

DR. VAN HORN: Well, and it's not just meat, right, Shelly? I mean, the group heading is meats and meat's the first word, but it's poultry, fish, dry beans, eggs, nuts. It's the whole proteins array. So, you know, I don't think -- and maybe it's just the order of this, but, you know, I don't think it's necessarily meat that is the single driver here. It's the whole concept of protein quality including any of these and all of these foods. I suppose we could do, you know, a further breakdown and drill into red meat versus poultry versus fish, et cetera, since we are advocating, you know, consumption of

more omega-3 fatty acid-rich foods, fish being one of them. You know, it might be valuable to dig a little deeper in this particular category so that we can get a better sense of exactly where the protein is coming from. And recognizing currently, as we all know, that the number one source of dietary iron is fortified cereal right now.

DR. NICKOLS-RICHARDSON: Right, and we are addressing in the chapter, sort of, the sources of iron and sort of keeping in mind that with the non-animal-based iron sources that the bioavailability obviously is a little bit less, but keeping that in mind.

But as we come to maybe iron as a concern for women of reproductive capacity, if we have further questions or comments about iron and the protein and the meat, then we can come back to that again a little bit more.

Cheryl, I think you were wanting to make a comment?

DR. ACHTERBERG: I think the

comment was made. It's not meat per se, it's the meat group, and there are a lot of other foods in the meat group.

DR. NELSON: This is Mim. I think just echoing that, I do think that it might be time to disaggregate this group. Because from the rest of the report, I mean, we're trying to get more fish consumption, we're trying to get more, you know, vegetable-based proteins that I think we need to be consistent in terms of the implications.

DR. APPEL: This is Larry again. I think that this is treading on an important sort of overarching issue, which is the name of this group. And I had a sidebar conversation with Janet King, and you know, if there's one thing she wished she did it was to not say meat and beans. And I was sort of interested, because we said the meat group. We conveniently dropped the beans. And I've really been wondering whether -- you know, I know it doesn't; and maybe we're not in the

position to spend a lot of time on this, but maybe we should rename the group as a protein source. I know that that might be oversimplification, but I think that's how people are thinking of this and of which you could get it from several different forms.

DR. NELSON: Yes, I agree. It's Mim. I think it antiquated. I think we've got to shift that nomenclature.

DR. VAN HORN: Yes, I actually find myself editing in some places, you know, the order and instead of saying meat, poultry as we usually do, I started putting fish, poultry, meat just in terms of being able to draw emphasis to the foods that we are advocating. I think we can't on one hand say increase omega-3 and not then also advocate where the omega-3 is coming from, recognizing we're also talking about reducing saturated fat and reducing dietary cholesterol.

So, you know, trying to make sense out of this in terms of the recommendation and

the practical translational message that needs to come out, I think you're right and that maybe we should at this point, you know, do away with that old title and call it, you know, the protein group or something like that.

DR. ACHTERBERG: This is Cheryl. I have to jump in. A basic premise of this whole group at the outset looking at food groups of concern is to describe what our recommendations are in terms of food and not nutrients. If we decide to make that leap to change the name to something like the protein group or even a protein food group, then I think what we are sliding into is changing all the group names to more nutrient-based, or at least macronutrient-based categorization. And I think that's a much, much larger issue that would have to be considered very carefully. And if I remember right, that's not even within the purview of the Dietary Guideline Committee. But rather, the USDA sets the food

patterns and food groups.

DR. VAN HORN: Yes, well, we can only recommend and advocate, but you raise a very good point, Cheryl, you know, that we wouldn't want to have an outlier in this particular group. So, maybe we just need to, you know, reconsider what we call it or come up with an acronym or, you know, something that would relate to the foods, but not necessarily, you know, emphasize red meat as the single most important source as much as drawing from the entire array in a way that accommodates all these nutrient recommendations.

DR. FUKAGAWA: This is Naomi. So much of the focus ends up being on the needs for iron. We also have to be cautious that people don't think that iron fortification is good for everyone, because that is truly gender or sex and age-dependent. And so, you know, I mean, red meat is a good source of that, but so are other foods. And so, we

somehow have to balance it. And I agree with all of you for the rest of the comments.

DR. NELSON: But maybe the issue - this is Mim again - that it's in the implication that we need to increase -- this is a food group of concern, but within the food group these are the foods we need to increase, not certain other ones.

DR. RIMM: Yes, I like the idea of disaggregating and having fish, poultry and eggs as one, or nuts and legumes as another, or those together. And then sort of the red meat/butter thing separately just because of everything else we've been saying yesterday about processed meat and yesterday about saturated fat. I mean, we don't have to call it protein group or two separate protein groups. We could call it by their foods, but disaggregate the food groups.

DR. SLAVIN: I would suggest we, as being on this Committee, that we get to the iron part that Shelly's going to present. And

also, we've done modeling on proteins, and one of the issues is calories. So, I think as those things get presented, we'll have more information for this discussion, and I'd really recommend we let Shelly get to that.

DR. NICKOLS-RICHARDSON: And thank you for all of these comments. And I do apologize, I do tend to drop the rest of the title of that to make it shorter. So, Trish actually has provided some information to me, and obviously everyone's falling short in dried beans and peas. Everyone's falling short in fish consumption, including the particular group of concern here. So, it is, you know, several parts of that group where we're really falling short.

And then thinking about the most bioavailable sources of iron and that being one of the key aspects of this, I think we can tweak this and word this a little bit better to where we're focusing on those foods that we really want to focus on without having to

regroup this entire food group.

But we'll take it back to the Committee and discuss some more, and thank you for that.

Okay. I'm going to move forward here, keep plugging along.

One of our topical areas is nutrients of concern, and I do want to remind everyone that we have presented nutrients of concern at a previous meeting. And so, our four key nutrients of public health importance or significance include vitamin D, calcium, potassium and dietary fiber. Today what we're focusing on are vitamin D and modeling of the calcium question. So even though these are not the only two nutrients of concern, I'm just going to remind everyone that because we've presented the other two key ones, we're just going to focus on these two.

I'm actually going to turn things over to Mim who will talk about vitamin D and present this for us.

DR. NELSON: Hi, this is Mim. And we've talked about this a little bit in some of the previous meetings, but here is sort of what we've come up with. The draft conclusion is that there is strong evidence that indicates that many children and a majority of adults do not meet the adequate intake for vitamin D. Furthermore, a significant portion of the population has deficient or inadequate blood levels of vitamin D to promote health and to prevent chronic diseases such as poor bone health and possibly certain types of cancers, cardiovascular disease and immune-related disorders. This is especially apparent in people living in northern latitudes, in persons with dark skin and in overweight and obese adults.

Next slide, please. The background is that there is in the last -- I'd say eight to ten years, there's a lot more emerging research on vitamin D and health that goes beyond bone health. We did not conduct

an independent systematic review, NEL search for vitamin D because the Institute of Medicine has concurrently empaneled an expert Committee to review the 1997 dietary reference intakes for vitamin D. And that's expected in the next couple of months, those results from that Committee.

So, what we did do, because we felt it was imperative that we do something, our strategy for review was to look at the National Institutes of Health Conference, Vitamin D and Health in the 21st Century, an update, and an NIH roundtable discussion with experts that was held after the conference, and this was published in AJCN in 2008. We also looked at the Agency for Healthcare Research and Quality, AHRQ, Evidence Report for Vitamin D and Calcium. This is what's been used -- some of which has been used by the IOM Committee, and that was just published. And then we, also with the help of USDA staff, examined current vitamin D intakes

and status.

Just a little background. It's important for optimal bone health and other body systems, including the immune system, cardiovascular and reproductive systems. There is emerging research that's shown a reduced risk of type I diabetes, some cancers, autoimmune diseases and infectious diseases, however, there seems still to be a need for further research to fully establish these relationships.

Next slide. Little bit on vitamin D intakes, looking at NHANES 2005 to 2006. And understand that we base this on the current adequate intakes, not what we presume the IOM may or may not do. So, looking at just the AI for children, less than 65 percent of children meet the AI for vitamin D. Less than 50 percent of females, 53 percent of males and about 10 percent of men and women over age 50 that do not currently meet the AI.

Contributing scientists to the

roundtable discussion. This is a really tricky one, because there are no government-established criteria for blood concentrations of vitamin D, but the roundtable group came up with these three demarcations of less than 27.5 nanomoles per liter, less than 50 nanomoles per liter, and less than 75 nanomoles per liter. And looking at those demarcations, about 30 percent of people aged 12 and older had serum levels that were lower than 50 nanomoles per liter and about 15 percent of children aged one to eleven had serum levels that were less than 50 nanomoles per liter.

And after adjusting -- there's been a bit of a measurement drift in the NHANES data set, and Looker's done a lot of work on, the concentrations in the population have actually, seems to, even when you account for the drift, gone down from 1988 to the early '90s to current times.

Implication is that all children,

adults and the elderly are encouraged to meet the AI for vitamin D. Children and adults and the elderly with deficient or adequate blood levels of vitamin D should consume more vitamin D-rich foods in both naturally-occurring and fortified forms and consider supplementation with vitamin D to bring blood levels into an adequate range.

What I will say here also is that we're trying to be a little bit elastic, so whatever the IOM comes up with with a new adequate intake for vitamin D, that this would hold to whatever the IOM comes up with.

Next slide. Research recommendations. We need more high-quality long-term, especially dose-response study with relevant health outcomes that include bone as well as other functional outcomes related to the immune system, autoimmune disorders and chronic diseases such as cancer or diabetes. I think that the issue here is really a dose-response.

Next slide. Investigate the metabolic partitioning, fate and mobilization of key vitamin D metabolites at recommended and greater than recommended levels. This issue of obesity is having a real effect on vitamin D levels, because there seems to be some sequestering of the vitamin D in the fat tissue, which may not be all that great.

Next slide. And then go back. So, I'm going to stop there. Any questions?

DR. APPEL: Yes, this is Larry. This is obviously a rapidly moving area, and we can't really even say too much given what's going on with the IOM, but just wondering about the comments about consider supplements, because that really is sort of a hot potato. And even with omega-3, we did come out and state that, even though there actually are some, you know, well-designed clinical trials. And I'm wondering if that could be that phrase drops.

DR. NELSON: You know, I'm not an

advocate of supplements, with the exception -- I actually think that it's really hard for people to get enough vitamin D to keep their blood levels at an adequate range without supplements, and this is especially for older adults. I think that, you know, there's been even more research on blood levels and probably 75 percent of elementary schools; we've just finished this study in Massachusetts, that are low in vitamin D. I think it's going to be really hard to do it with just food.

DR. CLEMENS: And, Mim, this is Rog. Thank you very much for the very important continuity between what your group has identified and the IOM report.

One of the issues that we have to look at as well is that most of the foods that are fortified with vitamin D actually have under regulatory constraints. So, even if the IOM report were to augment the current standard or recommendation, the food industry

is really challenged to put vitamin D in various food supplies because of the regulatory constraints at this time. So, clearly we need to consider perhaps that what are the regulatory issues and what are the implications for dietary supplements?

DR. NELSON: Yes, I think that's an issue. You know, really I'm not sure what the difference is between somebody taking a supplement and then somebody eating lots of foods that are, you know, extra fortified with vitamin D. I think that there are some constraints on the food industry. I predict that the upper limit is going to change even if the adequate intake doesn't change for vitamin D. It's the one nutrient for all the obvious reasons that, you know, there isn't much in the food supply anyway, and then people aren't getting outside anymore. People are putting sunscreen on. This obesity epidemic is causing a drop in vitamin D levels. I think it is just -- sort of the

anthropological, sort of evolution of this is such that it's difficult to get it in the foods. So, I'd be interested to hear if any other people on the Committee also had any comments.

DR. VAN HORN: Well, Mim, somebody's going to be talking to us soon about the fluid milk reduction as well, and, you know, recognizing that that, especially for children, represents the single richest source. And of course, with reduced intake and increased intake of sugar-sweetened beverages, et cetera, that further contributes, especially in that age group, to the, you know, insufficient intake of vitamin D.

DR. NELSON: Yes.

DR. VAN HORN: I think that the caution that Larry is raising, and I think the Committee has, you know, discussed this before, is that in our capacity in pointing out the evidence related to, you know, what

currently exists and the data and the research, et cetera, you know, this particular topic certainly has had a flurry of activity of late, and I think those data are being carefully reviewed. And of course the IOM report is in fact, you know, imminent at this point and hopefully will come up with what is the best recommendation at this time. But I think for us at this point, without the additional evidence that suggests that we have data regarding use of supplements and the safety and efficacy, et cetera, you know, just puts us a little bit at a disadvantage, and our goal is to be evidence- based.

DR. NELSON: Well, I think it is evidence- based. But, I think the one thing we could do is to -- the one paragraph -- we could go back to the implication slide, is to focus more on foods, you know, to consume more vitamin D- rich foods. We could maybe list more of those. We do have a table in the chapter that lists all the most vitamin D-rich

foods, and they would actually I think complement some of the foods that are lacking. I think that --

DR. FUKAGAWA: This is Naomi. I also think we do have to be cautious about, you know, treating blood levels, because it's an integrated organism that we're dealing with, namely us.

DR. NELSON: Yes.

DR. APPEL: Yes, this is Larry. I want to follow up on that, because I think it's the way you actually phrase that, to bring blood levels into an adequate range, and you acknowledged earlier that, you know, what's considered normal is still being debated. And I actually don't even know if there's a trial of where people were titrated to a blood level.

DR. NELSON: Yes, I think that's fair. I think we should take that out. I think maybe what we need to do is separate out the sentence, and I can modify the

supplementation to meet adequate intakes, but only after -- a lot of this is the elderly. You know, their needs are high and it's almost impossible for them to get it in foods.

DR. CLEMENS: Mim, this is Rog again. I appreciate your remarks. And might your table include possibly a paragraph of what technology is going to offer, and is in the process of offering to improve the vitamin D content of a variety of foods without fortification? There are some processes which are actually being utilized now to increase the vitamin D content of a variety of foods, and we might want to make a remark on that.

DR. NELSON: Sure, I'll add that. So, I'll soften the statement and take out the blood levels.

DR. CLEMENS: And I'll give you that information, Mim.

DR. NELSON: That would be great if you could send that to me.

DR. CLEMENS: Thank you, Mim.

DR. VAN HORN: And enhancing the bioavailability and issues of --

DR. NELSON: Yes.

DR. VAN HORN: -- you know, we can certainly advocate for that.

DR. CLEMENS: Yes. Yes.

DR. NELSON: Yes.

DR. VAN HORN: And encourage industry to help us with that.

DR. NELSON: Yes.

DR. VAN HORN: And, you know, I think that would be the steps that this Committee would feel comfortable taking at this time in the absence of the IOM report and, you know, focusing on our job of food, you know, and diet as recommendations.

DR. NELSON: I mean, and this isn't very far off. This is pretty similar to the 2005 DGAC, because there were a couple of nutrients in which subgroups may need to supplement. This was one of them. So, I'll soften this.

DR. NICKOLS-RICHARDSON: Okay. Thank you, Mim. And, yes, so the next component related to nutrients of concern is calcium. And we're sort of in the same situation with calcium also being under review by the IOM. But in relation to some of the questions that we have here in terms of food and food intake, there were a few sub-questions related to calcium being a nutrient of concern, and questions about what if people choose not to consume fluid milk and milk products and so on and so forth?

So, we have three sub-questions related to calcium that were handled through modeling exercises. Sub-question A is, what is the impact on nutrient adequacy if no fluid milk or milk products are consumed, and if calcium is obtained from non-dairy sources or other fortified foods rather than fluid milk and milk products.

Sub-question B is, what non-dairy calcium sources or fortified foods are the

most feasible alternative to milk products for those who choose not consume dairy foods?

And sub-question C is, how would the nutrients provided by the milk group be changed if more low-fat or fat-free fluid milk and less cheese were consumed?

So, just as a background or some rationale behind why we undertook this modeling exercise is that many Americans fall short of the recommended intake levels for fluid milk and milk products, as you've seen. Some individuals desire non-dairy calcium sources for a variety of physiological, psychosocial or personal reasons, so those wanting to avoid fluid milk or those who perceive that they're lactose intolerant or are actually diagnosed with lactose intolerance. And then the relative proportions of fluid milk and cheese consumption have changed over time and milk and cheese differ in some important ways in nutrient content.

So, just as this last bullet point to show you some those data. If we look at the green bar and focus on that and look at the trends from 1970 to 2007, the gallons per capita per year of total beverage milk, and the green line again has declined over that 40-year period of time. If we contrast this with cheese intake and look at pounds per capita per year from 1970 to 2007, again the green bar, focus on that one, we see that total cheese consumption has increased over that 40- year period of time.

So, to address sub-question A and the findings related to this modeling exercise, we found that when fluid milk and milk products are removed from the USDA Food Patterns, calcium dropped substantially below the adequate intake across all energy levels. Further, vitamins D and A, and choline, magnesium, phosphorus and potassium also fall below 100 percent of DRI levels in some or all patterns.

For sub-question B, our findings are that of the non-dairy alternatives evaluated as a substitute for fluid milk, yogurt and cheese in the USDA Food Patterns, soy milk fortified with calcium and vitamins A and D is the alternative with the most similar nutrient profile to fluid milk. And other non-dairy food sources were compared, including calcium- fortified rice drink or calcium-fortified orange juice, tofu prepared with calcium sulfate, green vegetables, green soybeans, white beans, and so on and so forth. And so, the soy milk fortified with calcium and vitamins A & D provided the most similar nutrient profile as a substitute food product.

For sub-question C, when fat-free fluid milk is substituted for some or all of the low-fat cheese in the USDA Food Patterns, we find that energy, protein and calcium levels remain similar. Vitamin A and choline, magnesium and potassium increased slightly. And sodium, cholesterol and saturated fatty

acids decreased slightly. And vitamin D content is substantially improved across energy levels suggesting that incorporation of fat-free fluid milk as a substitute for low-fat cheese would make an important contribution to nutrient intake.

So, draft conclusions here include that for individuals who avoid fluid milk and milk products because of lactose content, a clinical diagnosis of lactose intolerance is important to determining whether dairy-based foods should be eliminated from your diet patterns. I know this seems somewhat incongruent with the modeling information that was presented, but this is here because of the recent State of the Science Panel on lactose intolerance, and this comes from their draft report of their consensus statement. So, making sure that individuals who perceive lactose intolerance are actually diagnosed so that they don't eliminate a food group and foods from their diet that may not have to be

eliminated.

Lactose-reduced or low-lactose dairy-based products of fortified soy milk may assist some individuals in meeting nutrient needs -- milk and milk products food group.

I'll stop here, see if there are any questions related to these three sub-questions and the modeling process for calcium.

DR. ACHTERBERG: This is Cheryl. Maybe in the chapter or somewhere we should make note of the difference in price points here for these substitutions as well?

DR. NICKOLS-RICHARDSON: Okay. All right. Well, thank you, Cheryl.

And we'll move onto --

DR. APPEL: This is Larry. I have a comment or a question.

DR. NICKOLS-RICHARDSON: Yes?

DR. APPEL: That second, or the first bullet, the clinical diagnosis, it turns eating into sort of a medical issue, and I'm

wondering if that's a little bit too strong. I just can tell you in our feeding studies if somebody has a problem with milk, we give them lactate or equivalents, and it's sort of like a therapeutic test, but with a pretty benign approach. And so, we don't go through any formal diagnostic testing, which I think would be, you know, massive if you think of it applied to the full population. It's a pretty strong statement, clinical diagnosis.

DR. NICKOLS-RICHARDSON: Okay.

DR. PI-SUNYER: Yes, I would agree with Larry.

DR. VAN HORN: And, Shelly, in regard to the report that you're referring to, are you suggesting -- or I think that what you're indicating is that that report that was showing that many fewer people actually are lactose intolerant and think they are? Is that the point?

DR. NICKOLS-RICHARDSON: Correct, that is the point. And I think that, you

know, this certainly can be rephrased and I can go back to that report, but, yes, that is the point, that there are more people avoiding milk and milk-based products because of their perception of lactose intolerance.

DR. SLAVIN: This is Joanne. Shelly, I wonder about -- some of it could be protein allergies, too. So, probably it's good not to just focus on lactose. You know, people could be avoiding dairy because of protein intolerance. So, I agree we need to rephrase this.

DR. NICKOLS-RICHARDSON: Okay. Good point.

Okay. And then moving to shortfall nutrients. And so, again sort of keeping in mind that for nutrients of concern we have a two-prong approach to identifying our nutrients of public health implication of significance. And just to present here that as we looked at choline and phosphorus, and you'll see that here in just a second, we did

ask the question about choline intake and does that present a significant public health concern. And our outcome for choline is although most age/sex groups do not meet adequate intake, there really is a lack of either biochemical data or trials to really suggest that this is of public health concern at this time. And so, choline then is a shortfall nutrient, but has not been sort of moved to the status of nutrient of concern.

Moving to phosphorus then, again the question is are there subgroups that at risk for inadequate intake and what does that mean? And again, our NHANES data suggests that nine to eighteen-year-old girls have inadequate intake of phosphorus in a good majority of those individuals. But again, there's really not biochemical evidence or related health concern to suggest that this is anything more than a shortfall nutrient and with some very well-pointed recommendations for food intake, these individuals could

likely meet the recommendation for phosphorus.

So, any questions about shortfall nutrients before I move to selected population concerns?

DR. PEARSON: This is Tom Pearson about the issue with choline. Obviously this is then immediately juxtaposed to dietary cholesterol issues with fewer eggs being less choline. So, I think this is an important place to emphasize these non-egg sources of choline. We were looking at some consumption data of the 38 percent of cholesterol in the diet from eggs now going down to around 24 percent, obviously suggesting lower egg consumption. So, whatever shortfall nutrient issues you had with choline would appear to be getting worse.

DR. NICKOLS-RICHARDSON: Yes, you know, choline is similar to vitamin E in that in the USDA Food Patterns it is always below the AI.

DR. PEARSON: Right.

DR. NICKOLS-RICHARDSON: So, I think that really kind of no matter how we model it, it always falls short. But again, looking at what are the key health-related issues, we don't really have evidence there quite yet. So again, I think, you know, you're point's very well taken related to egg consumption, obviously being a very good source of choline. We will have a table for choline sources and direct people to that table and some of these other things that we're emphasizing; fish, for example, that through some of these other food sources we can hopefully, you know, at least get a better handle on choline consumption.

DR. CLEMENS: Shelly, this is Rog. I know your group didn't look at say the pregnant woman. Is it possible that the absence of these -- or in light of these kinds of data that we have insufficient intake relative to the IOM recommendations and that there's actually up-regulation of choline

synthesis for pregnant and lactating women. And do we have any information on the interplay of choline and folic acid relative to methyl transport and the onset of neural tube defects?

DR. NICKOLS-RICHARDSON: Yes, great question and, yes, obviously there is metabolic work with that relationship, folate, choline, B12, and so it is very important in that interplay. I can't answer your question about the up- regulation issue, but I can say that there are only maybe two or three human clinical trials really looking at choline and neural tube defect. And it does seem to be important, but I don't think that those studies can really lead us to making a recommendation compared to folate, for example, in the data that we have about folate.

DR. CLEMENS: Thank you.

DR. NICKOLS-RICHARDSON: Okay. Then we'll move to nutrient issues for

selected population subgroups.

The three key things we're looking at here include folate, B12 and iron. We've presented the folate as a very broad question, so what will be presented now is just food pattern modeling, and this really relates to the question that has come up about if individuals select all grains as whole grains, what happens then to nutrient quality of the total diet, and what does that contribute?

So, the rationale behind this folate modeling question is that the 2005 Dietary Guidelines recommend that at least half of all grains be whole grains. And so, I've already mentioned the 2000-calorie pattern. What this means is that at least three ounce equivalents of grains be whole grains. The most commonly consumed refined grains are enriched with iron and other B vitamins and fortified with folic acid. Whole grains typically are not enriched or fortified except for some ready-to-eat whole grain

cereals.

Some of the key assumptions in the folate modeling process included that the proportions of non-whole grain products were maintained but replaced with a whole grain version. The fortified whole grain ready-to-eat cereals were included at levels currently consumed, so not trying to over include foods that really aren't consumed at current levels. And the non-whole grain ready-to-eat cereals are replaced with either -- and two scenarios then were modeled, non-fortified whole grain cereals or then fortified whole grain cereals.

What was found then is that when all recommended grains are consumed as whole grains rather than half whole and half-enriched refined grains, and these whole grains were not fortified, dietary patterns were insufficient for dietary folate for girls 14 to 18 years of age, women of all ages with low to moderate energy needs and men older

than 50 years of age with relatively low energy needs. In addition, dietary patterns were low in iron for boys and girls two to eight years of age and then adolescent girls and women age 14 to 50 years. So again, that's without any enrichment or fortification of those whole grains. That was scenario 1.

Scenario 2 findings. So, when all recommended grains are whole grains rather than half whole and half-enriched refined grains, and these whole grains include then fortified ready-to-eat cereals in the dietary pattern, what was found is that dietary patters are then actually adequate for folate and iron.

So, a draft implication is that if individuals desire to consume only whole grains in their dietary pattern, some of those whole grains should be fortified.

I think I'll move onto our next population subgroup here, and then we'll stop after this one. This is the iron question.

And a draft conclusion here is that substantial numbers of adolescent girls and women of childbearing age have laboratory evidence of iron deficiency. If we look at the evidence and look at intake data, then it's estimated that 15 to 17 percent of women of reproductive age do not meet dietary iron requirements. NCI data for food group intake suggests that about 75 percent of 14 to 18-year-old women and 60 percent of 31 to 50-year-old women don't meet the suggested ounce equivalents. And I'll carry out the whole food group here. Meat, poultry, fish, dry beans, eggs and nuts.

The next slide is again what you've seen before in relation to the percentile data, so I'm showing that to you again. Now, carrying it further to laboratory data, the biochemical evidence, NHANES data indicates that greater than five percent of individuals aged one to fifty-nine years, including women in this, have inadequate serum

ferritin concentrations and that more than 10 percent of individuals of all ages have low levels of transferrin saturation. And this is suggestive of iron deficiency.

So, a draft implication is that efforts are warranted to increase dietary intake of iron- rich foods and of enhancers of iron absorption by these special populations. So again, focusing on women of reproductive capacity and encouraging iron-rich foods, whether that be meat or poultry, fish, other foods.

Okay. So, questions related to these nutrient issues for the selected population subgroups?

DR. RIMM: This is Eric. The whole grain modeling probably is troubling some people, not because you got anything wrong. It's only because it seems that it's almost implying that we shouldn't be recommending whole grains for everybody for most servings.

And is that just because we were modeling it that the other folate is coming from what they typically eat, or if people eat within the guidelines they still would be short on folate?

DR. NICKOLS-RICHARDSON: Yes, great question.

DR. RIMM: Is that clear?

DR. NICKOLS-RICHARDSON: Yes, that question is very clear, and in anticipation of this question Trish gave me some information. So, if we look at the 2000-calorie pattern, where vegetables are suggested at two-and-a-half cups, fruits at two cups, that provides 190 micrograms of folate, total dietary folate. And then the grains from fortified whole grains would be 374. So, we would need, in addition to the vegetables and fruits and the contribution of folate there, we would still need the fortified grains.

Does that answer your question?

DR. RIMM: Yes, I guess so. It's

just surprising to me that there's -- I guess because a lot of the fortified grains have substantially more folate than the whole grain version --

DR. NICKOLS-RICHARDSON: Yes.

DR. RIMM: -- and maybe the DRI increased for folate. It just seems surprising that you can't achieve this by having more whole grains in your diet and not achieve the requirement for the fortified grains.

DR. SLAVIN: This is Joanne here. It's a little confusing though, Eric, because a lot of the cereals are whole grain and they still have folic acid. But, it's only refined grains that are officially fortified. And so, other people -- I think Roger brought this up with vitamin D, too, their hands are tied about what they can't do because of standards of identity. So, they just --

DR. RIMM: Oh, right, that I realize.

DR. SLAVIN: Yes.

DR. RIMM: It seems like we're saying don't have whole -- I mean, well, I guess the implications are you really need to have more folate if you're having more than half your grains as whole grain.

DR. SLAVIN: Yes.

DR. RIMM: We're not going to be saying don't have whole grains.

DR. SLAVIN: Right.

DR. VAN HORN: This is Linda. And especially when we consider the dietary fiber recommendations. I think, you know, this is another example of why we need other sources of dietary folate, including things like beans. Lentils are an excellent source. We all know, you know, there are other ways to get more dietary folate.

DR. RIMM: That's true. So, how does that work into the patterning? I mean, can we --

DR. VAN HORN: Yes.

DR. RIMM: -- have that as an implication? It just seems like this is one of those things where it's very clear. The way you've modeled is exactly right. It's just that it doesn't agree with everything else you're saying, because we're essentially saying take the fiber out of your diet.

DR. VAN HORN: Right. Yes, right. Well, every single chapter has an issue like this.

DR. RIMM: Yes.

DR. VAN HORN: And as I've gone through and edited, you know, the chapter so far, it would appear to me, and, you know, when we get down to the final go-around here, that when we hit a topic like this, is exactly where we need to provide a table illustrating what alternate dietary sources are of some of these shortfall nutrients. And, you know, I think it is a complicated but important message, you know, that advocating whole grains makes total sense, but in terms of

achieving dietary folate intake, one cannot only rely on fortified cereal or, you know, refined grains as their primary source or their only source.

DR. FUKAGAWA: The other important thing; this is Naomi, is that we have to remember that not all populations need, you know, fortified folate products.

DR. RIMM: That's a good point.

DR. FUKAGAWA: And so, you know, weighing the benefits and risks --

DR. RIMM: This is just for women and girls that get -- women that can become pregnant for some of these.

DR. VAN HORN: Right.

DR. SLAVIN: Right. And also I think we need to remember; this is Joanne here, is that the refined grain and enriched grains, most people are getting more than enough of it. And we keep needing to make this message to not just add whole grains, but to substitute so this balance idea that we

don't want to push grains on people, but, you know, get into balance. So, if people would go with half of their grains and then keep the grains where they should be, you'd actually be in pretty good shape if you modeled.

DR. NELSON: And this is Mim.

DR. CLEMENS: And, Shelly, this is Rog. This is really a nice presentation. I appreciate your comments on bioavailability. Will your chapter include any type of summary or paragraph or statement or table to address the bioavailability of say folic acid, iron and other nutrients, whether it's from grains or from cereals?

DR. NICKOLS-RICHARDSON: That would be new.

DR. CLEMENS: Clearly, you'll --

DR. NICKOLS-RICHARDSON: We weren't anticipating doing that, but it's a good thought, good question. We'll talk about that at our next subcommittee conference call.

DR. CLEMENS: It's really quite

complex. To Linda's comment, you just can't arbitrarily choose an iron source or a folic source because they don't behave the same in the same food matrix or different matrices.

DR. NELSON: This is Mim. You know, we used to get our folate from green leafy vegetables, so, you know, getting back to that would get us two things at once.

DR. SLAVIN: But I think that's like grains have typically been enriched or fortified is because most people are going to consume that on a daily basis. So, from a public health way of getting nutrients to people, it's a really good vehicle.

DR. NELSON: Oh, I've done the folate question; I completely agree. I just think that, you know, if we ate more green leafy vegetables along with whole grains and some, you know, fortified refined, we would be doing a lot better.

DR. CLEMENS: And, Mim, great question, great point. Has anyone done any

calculations on the production of green leafy vegetables and the potential availability of those vegetables to meet these folic acid requirements?

DR. NELSON: I don't know. I could look at the modeling, but, I mean, historically that's the way humans mostly got their folate?

DR. CLEMENS: We just have 300 million people to feed in the United States and I don't think that the production -- we'd have to look at some ARS data that in fact we're producing an adequate amount --

DR. NELSON: Oh, we're not. No, we're not. We know that. And, you know, we talk about in the integration and translation chapters.

DR. CLEMENS: Absolutely.

DR. PEREZ-ESCAMILLA: This is Rafael. But it's not only green leafy vegetables. It's also orange juice in the U.S. and beans in many Latin American

countries. They are contributors.

DR. NELSON: Yes.

DR. PEREZ-ESCAMILLA: So, it's possible to get a much higher amount through foods, but --

DR. NELSON: And foods --

DR. PEREZ-ESCAMILLA: -- that's a part of the discussion at the table toward the decision to fortify the food supply was made.

DR. NELSON: Yes, and I think that -- Mim again -- that we shouldn't lose sight of all those fine, you know, nutrient-dense foods that do have folate, that there's a variety of them. And, you know, we have just focused on grains because of the fortification. I think we need to make sure people realize, unlike some other nutrients, I mean, there are a variety of really wonderful foods that have folate.

DR. RIMM: Yes, this is Eric again. I agree. I think that, you know, I'm just trying to think down the line of how this

is going to be used to translate into school lunch programs and institutionalized feeding. They're actually going to interpret this as don't go to more than half of your grains as whole grains because of all these other concerns. And, you know, I don't know what we can do it about it. If there's something that's saying, you know, eat more than 50 percent but include in your diet, you know, fruits, vegetables and beans and these other sources, because I am afraid that we are parsing this too carefully and then we're going to end up doing a disservice to the guidelines.

DR. ACHTERBERG: And Cheryl here. And why can't we fortify more whole grains? We do some but not others, or we do sometimes but not other times. Why not do it more often?

DR. RIMM: Well, that could happen also. It's a shame that we don't stick to the whole food --

DR. SLAVIN: You know, I want to get back to what Naomi pointed out, too, is that there's always this issue about over-fortification, the folic acid and B12 -- who's eating all the grains? It's people eating a lot of calories, so they may not be the people needing so much folic acid. So, it's a really hard thing to - -

DR. FUKAGAWA: Right, so I don't think the answer is necessarily increasing fortification. It's, you know, probably trying to get it from other sources.

DR. SLAVIN: Exactly.

DR. NELSON: Yes, so I just don't want to lose sight of that as opposed to just putting everything on fortified grains.

DR. ACHTERBERG: But we can't lose sight of what the typical American eats either. And neural tube defects has been a problem over the whole course of history. All the students of art history recognize the paintings over time. I'd even go back to the

Inca. So, it's a long-term human problem with humans not getting enough in their food supply. So, we have to consider what do people generally eat and how far can we move them?

DR. FUKAGAWA: The people who are producing food could help us tremendously, because it's a team effort --

DR. ACHTERBERG: I agree.

DR. FUKAGAWA: -- to be offering that would perhaps would be better choices. I think that's true --

DR. VAN HORN: My opinion --

DR. FUKAGAWA: -- as well as the indication, as I said earlier, of providing sources, making it readily available so that the average individual has some knowledge of what are the choices that could contribute, you know, and making that better known to them.

DR. NICKOLS-RICHARDSON: These are all great points and I do want to sort of

raise the point here that this is the piece of the folate question. And so, as this is presented in the chapter, certainly this will be the part of that whole broad question and there will be tables about sources of folate. So, I think maybe we can tweak this a little bit, the implication here a little bit that incorporates some of the thoughts and ideas that we do want to emphasize whole grains, we do want people to consume dietary fiber. Folate is a piece, a component of this, to be concerned about those folate sources. And if you're consuming whole grains, then being sure to -- and it probably is part of one those healthy total diet packages, but if you're consuming whole grains you're also more likely to consume vegetables and fruits. But I think we can tweak this a little bit to emphasize those points and have the consumer at the total diet.

DR. PEARSON: Shelly, are you going to get into the discussion obviously

that's been going on at CDC about the need for more fortification based on the etiologic data coming for neural tube defects compared to the randomized controlled trial data of fortification in those individuals?

DR. NICKOLS-RICHARDSON: I'm going to turn that over to Mim.

DR. NELSON: I knew you would.

DR. NICKOLS-RICHARDSON: Yes. My initial response is no, because I think with the evidence-based analysis that we've looked at that current fortification is adequate in relation to how that has changed blood folate levels.

DR. PEARSON: There's a lively debate out there.

DR. NELSON: There is a lively debate, Tom. I think that we can't necessarily enter into that fray at the moment because I don't think that our Committee was, you know, put together to do all of that. And our conclusion with the folate, which we

presented last fall, we basically state that there is solid evidence at this point that neural tube defects have gone down and that we recommend that the fortification stay as it is because there's a risk benefit ratio here. So, it's not across the board positive, so there are reasons to not change it at this point in time. But I think that's going to have to be left to another Committee

DR. PEARSON: Yes. Yes, I agree. It's quite complex.

DR. NELSON: It's quite complex. And the advocacy, you know, you got the colon cancer people on one side; you've got the neural tube defect people on the -- and dementia people on another. There's a lot of different things that are going on. I think we should just have actually better surveillance and research on it at this point and make a decision in maybe like five more years before we go tinkering with it.

DR. PEARSON: I think that's

probably good advice.

DR. NICKOLS-RICHARDSON: Okay. I do want to go ahead and move onto nutrient supplements, because I think this will have another bit of lively discussion. And if it's acceptable, Linda, if we could go until 11:30?

DR. VAN HORN: Yes, of course. Let's keep going.

DR. NICKOLS-RICHARDSON: Okay. All right. So, our next topical area is nutrient supplements, and we have an overarching question under this area. This is a new question for the 2010 Committee.

Just to point out some of the limitations of what we were looking at related to nutrient supplements, because of the pieces of evidence that we used, we were limited to looking at vitamins and minerals. With the new questions about DHA, EPA, we have also considered that, but we've not looked at other dietary supplements like botanicals, hormones, performance enhancing supplements such as

specific protein products or amino acids and so forth. So, that was beyond the scope of really what we were looking at and what your primary question really is here.

Multivitamin and mineral combinations of more than three vitamins or minerals were evaluated, functionally related nutrient pairs. So for example, calcium and vitamin D were examined. Single nutrients were also evaluated and really using randomized control trial data.

The draft conclusion, and this really relates to our very broad question about sort of a multivitamin/mineral supplement. And what we are drafting as our conclusion is that for the general healthy population there is a lack of evidence on which to base a recommendation for the use of a daily multivitamin/mineral supplement in the primary prevention of chronic disease.

Further, there's limited evidence that suggests that supplements containing a

combination of certain nutrients are beneficial in preventing or reversing chronic disease when used by special populations such as zinc or zinc plus antioxidant supplements in preventing further age-related macular degeneration in individuals with intermediate or advanced disease. And certain nutrient supplements appear to be harmful in other subgroups such as beta-carotene or beta-carotene plus vitamin A in increasing lung cancer risk in smokers and individuals exposed to asbestos. And regulation of vitamins, multivitamin, mineral and other dietary supplements is lacking such that safety from nutrient toxicity and quality of products cannot be assured.

Our pieces of evidence that we looked at include an AHRQ report that was initiated for use by the NIH State of the Science Conference that examined this question of multivitamin and mineral supplements. The AHRQ report was prepared in 2006 and the

conference was held in May of 2006 with the conference proceedings being published in AJCN in 2007.

From this particular report the AHRQ report addressed four questions. They looked at multivitamin and mineral supplements in the primary prevention of 10 chronic disease categories, including cardiovascular, cognitive function, so on and so forth. They reviewed 14 single nutrient supplements in addition to the multivitamin/mineral daily preparation, four functionally-related paired-nutrient supplements. For the report they searched articles between 1996 and 2006 and came up with over 11,000 potentially relevant articles. Of those, 63 randomized control trials were included and evaluated.

Some of the key findings from the AHRQ report is that there's a lack of randomized controlled trials on a daily multivitamin/mineral supplement and the effectiveness of primary prevention of disease

among health Americans.

Some other sort of bullet points of what was found in the AHRQ report is that there are benefits of beta-carotene, vitamin E and selenium on lowering gastric cancer in inadequately nourished men and women in China. So, keep that in context of the population that was examined. There is reduced overall cancer risk in men in France with beta-carotene, vitamin E, vitamin C, selenium and zinc; lowering of age-related macular degeneration and total mortality only in adults with intermediate or advance disease with zinc or zinc plus antioxidants; lowering of prostate cancer incidents and mortality in men, colorectal cancer in adult smokers and cardiovascular disease mortality in women older than 65 years of age with vitamin E; retention of bone mineral density in post-menopausal women with calcium supplementation and a reduction in hip and non-vertebral fractures and falls with calcium and vitamin D

supplements.

There was no effect of beta-carotene supplementation on cancer, cardiovascular disease, diabetes or sensory diseases in adults. No effect of vitamin A plus zinc or vitamin A plus beta-carotene on CVD, cancer or all-cause mortality in adults. There was an adverse effect of beta-carotene supplementation or combined beta-carotene and vitamin A on lung cancer and mortality in adult smokers and those exposed to asbestos, and increased incidence of kidney stone formation with calcium supplementation and discoloration of skin with beta-carotene, but a lack of randomized controlled trials in which safety has been tested.

Further, from this then with the AHRQ report information and looking at the NIH State of the Science Conference and their proceedings, primarily they brought in some additional experts to give additional testimony and data about vitamins and mineral

supplementation. And what they found and what they concluded was very congruent with the AHRQ report. A couple of differences related to vitamin E and cardiovascular prevention. They found little evidence or insufficient evidence to support vitamin E supplementation in prevention of cardiovascular disease in older women. They further reviewed folic acid supplementation and found it to be important for women of reproductive capacity. No effect of B6 or folic acid with or without B12 on cognitive decline in older adults. And they further went and identified a lot of limitations about nutrient supplementation in gaps and knowledge.

We also looked at a supplement of the American Journal of Clinical Nutrition related to omega-3 fatty acids. This is not part of the AHRQ report. This is not part of the State of the Science Conference, so this was a separate supplement of AJCN. And in looking at this information, there appears to

be promising evidence that pregnant women and lactating mothers should supplement with DHA at 200 to 300 milligrams per day primarily for cognitive development of their infants. It's a little bit less clear about the visual acuity question.

I will point out that this then is very consistent with the fish intake recommendation, and so as we go into discussion about this talk about how we suggest supplementation here and the way it's phrased currently.

Evidence that those with cardiovascular disease should supplement with 500 milligrams per day of DHA to prevent further disease, and the American Heart Association recommends one gram of EPA plus DHA per day.

We further did a hand search of articles from 2007 to the present, so post-the State of the Science Conference. There was one meta- analysis of beta-carotene

supplementation, finding again adverse effects on smokers and those exposed to asbestos.

The SELECT study of selenium or vitamin E, or a combination of that, was found to have little effect on prostate cancer in adult men.

A daily multivitamin/mineral supplement that included those nutrients listed here as a single supplement had no effect on cognitive function in community-living older adults in Scotland, but did have a modest association with verbal fluency among those older than 75.

In looking at an additional vitamin K that was added to a multivitamin supplement plus additional calcium and vitamin D didn't offer any further benefit to bone density beyond the simple multivitamin/mineral preparation with the calcium and vitamin D in older individuals, but those who had the best compliance; I think this was greater than 80 percent compliance with their supplementation,

there was a lowering of coronary artery calcification progression.

Variable effects of multivitamin/mineral preparations on cataracts in men and women, meaning that certain types of cataracts were prevented while other types of cataracts were actually facilitated through multivitamin and mineral preparation use. And then vitamin E supplementation had no effect on cataract incidence in the women's health study.

So, a draft implication here is that long- term effects on primary prevention of several chronic diseases are poorly defined with a daily multivitamin and mineral supplement use. Americans are encouraged to meet overall nutrient requirements within their energy levels that balance daily energy intake and expenditure really from food here. And the exceptions are folate supplementation in women of reproductive capacity, crystalline B12 supplementation among older adults which

has previously been presented; and so you didn't see that B12 question here today, and then potentially the DHA supplementation in pregnant and lactating women.

Research recommendations are really very supportive of the State of the Science Conference priorities, and so focusing on precision and self-reported intakes of multivitamin and minerals. Over 50 percent, about 52 to 53 percent of the population report using vitamin/mineral supplements, but being able to really get a handle on the frequency, the duration of those and what "use" actually means. Accurate composition of bioavailability data and evaluation of outcomes based on those factors with the multivitamin/mineral matrix. And this goes back to Roger's comment about that matrix and the bioavailability of these as supplement or in supplement forms and how that relates to the food matrix. Randomized control trials for primary prevention of chronic disease in a

diverse range of the healthy population, including safety and risk assessments.

I'll stop here with nutrient supplements and then open this for discussion.

DR. APPEL: Yes, this is Larry. I don't know if this fell through the cracks, but there's a meta-analysis that was published in JAMA after the AHRQ report. The senior author was Glude. And he expanded, you know, the list of potential harms beyond beta-carotene and indicated that supplementation with vitamin E might be harmful I think in high doses.

So, I think your conclusions have to be expanded. I know that this might generate, you know, some controversy, but it's now been reviewed twice with a similar conclusion.

DR. NICKOLS-RICHARDSON: Okay.

DR. APPEL: I can send you that reference, if you want.

DR. NICKOLS-RICHARDSON: Yes,

absolutely.

DR. RIMM: The only issue with that, Larry; this is Eric, is that a lot of those studies that were reviewed in there were very specialized populations and, you know, very small numbers in some of those where they were finding adverse effects. So, I don't think it was across the board, so I think we have to be a little careful that we're not changing a guideline for a small percentage of clinical populations.

DR. APPEL: Yes. Go ahead.

DR. RIMM: But it's worth reviewing again just to make sure.

DR. CLEMENS: This is Rog. There's a great review on the upper limits in toxicity that might want to be included as well.

On another point, again this is Rog, you made a really interesting comment on the regulations on dietary supplements. You may wish to include an update on that and

listen to Duchet of 1994. As you were all aware of, there are new GNPs that have to be implemented effective June of this year, which is the last time they -- and they tried a tiered approach. So maybe you want to look at that, as well as the standards established by USP on the production of dietary supplements, and do they have to meet basically drug production standards? So, I think we want to look at that very carefully, because there are regulations. Perhaps the clinical work needs to be addressed in some cases, but I assure you that my experience is that -- I teach food and drug law, that many of the many of the companies follow these really wicked standards that most people don't know about.

And lastly, if there's time, I'd like to ask Kelly or someone to bring up the slides on the limitations issues that we look at the fatty acid group relative to DHA and EPA supplements.

DR. PEREZ-ESCAMILLA: Shelly, this

is Rafael. In terms of your implications slide, you provide exceptions to the recommendation of getting the nutrients from foods.

DR. NICKOLS-RICHARDSON: Yes.

DR. PEREZ-ESCAMILLA: And you include DHA supplementation in pregnant and lactating women, but you did not include DHA supplementation among individuals with cardiovascular disease. And I thought previously you stated that there was fairly solid evidence that it can provide a benefit.

DR. NICKOLS-RICHARDSON: Yes, and, you know, I'll disclose that again the DHA/EPA sort of came to us a little bit late, so we're adding this in and hoping for this kind of discussion. And perhaps Tom or someone who really knows the cardiovascular and fatty acids literature best could suggest to us or recommend how we should handle that. Is that a population that we want to make that exception or add that exception to, given how

we're handling healthy versus those already with cardiovascular disease in the report? So, I'm completely open to suggestions and recommendations here.

DR. PEARSON: Yes, this is Tom, and Eric and Roger can jump in as well. We obviously dealt mostly with whole foods in the general population, although as was covered yesterday, we did break out with and without cardiovascular disease populations for both plant-based and marine-based omega-3 fatty acids.

I think one approach here would be to -- there is a very large randomized controlled trial literature on supplementation with some very large -- the Goetz trials, et cetera, obviously providing very good evidence. And I think much of this has been reviewed with the American Heart recommendations of that 1,000 milligrams of EPA/DHA and would be I think a reference again. We did not go there because this was a

specialized population and not a general population recommendation. So, I think you could handle this quite quickly with a very solid review of the evidence and recommendations, you know, from another body. I don't know if there --

DR. CLEMENS: Tom, the piece on expert opinion is up on the graphics. Why don't you go through those three slides, please?

DR. PEARSON: Right.

DR. FUKAGAWA: So, Shelly, one of the things that we did want to also do, which I think we had discussed, was to harmonize sort of the quote "recommendations" for supplement use with some of the other groups such as the AHA and things, and utilize their evidence-based work, since we didn't quite review supplements per se --

DR. NICKOLS-RICHARDSON: Absolutely.

DR. FUKAGAWA: -- of DHA and EPA.

DR. PEARSON: What's up here of course is supplementation for pregnant and lactating women, and the cardiovascular group is another group with even a larger database.

DR. VAN HORN: Right. Right.

DR. CLEMENS: And you see that database, which is on this slide that's being broadcast right now I think, this is the group -- the fatty group put together, and you see the five bullets there. So, we did look at this quite seriously. And the next slide indicates the implications which raised was -- Larry and others raised yesterday. We examined this and clearly we emphasized that we clearly look at the risk benefit analysis that came out of the IOM report in 2007 that indicated that the consumption of fish for pregnant and lactating women was preferred and that the benefits are in fact maximized with fish high in EPA and DHA obviously lower in methylmercury. And these are consistent with what we discussed, you know, with the Food

Safety Subcommittee, and Rafael will address some of this just today.

But there are limitations and they're indicated on the next graphic. And these are the limitations. And these are just -- when we did our analysis and evaluation of the evidence, we clearly eliminated or excluded many of the supplement forms, and some of those supplement forms are indicated here. It was the consensus of the group that we should reexamine that and look at the supplementation. We certainly could do that, but it's a whole new kettle of fish.

And you could tell here that most of the studies that were in fact excluded were dealt with the pregnant and lactating women, and the impact obviously on neonatal health. And we addressed some of that issue yesterday. Clearly, the studies that were not included were included here, noted here that breast-feeding versus infant formula feeding prior to DHA addition -- and that occurred in 2001 when

DHA was initiated and approved for addition in the United States. And all the infant formula manufacturers included DHA from algal sources in infant formula as of 2002 in the United States.

So, we want to put proper perspective in on the context of all the evidence as we have today. And if you think that we should include some additional studies relative to DHA/EPA supplementation, we could certainly augment that in the time constraints that we have.

DR. NELSON: Shelly, this is Mim. I have another quick question. There's a 2008 AJCN paper with calcium and vitamin D supplementation out of Creighton State that looked at a reduction in cancer incidence. Was that included in the hand search, do you know?

DR. NICKOLS-RICHARDSON: I don't believe it was.

DR. NELSON: If there was hand

search, I should get you that paper, because it is on incidence on cancer with D and calcium and showed a reduced incidence. So, I'm just also thinking about the -- we need to coordinate with the vitamin D implication, too.

DR. NICKOLS-RICHARDSON: Sure. Yes.

DR. NELSON: Okay.

DR. NICKOLS-RICHARDSON: I guess I would say that, you know, as we move forward with this particular topic and section in this chapter, then Tom and Roger and Rafael and Eric will talk about how to handle further DHA and EPA. And then, yes, Mim, we'll sync the calcium/vitamin D.

DR. NELSON: Okay.

DR. NICKOLS-RICHARDSON: Okay. So, we'll move to the next part, and this looks or begins to look at some of the behaviors related to nutrient adequacy. And certainly this isn't all behaviors that would

relate to nutrient intake, but to begin to look at and talk about behaviors that are important here.

So, we decided to focus on breakfast, snacking and eating behaviors. And our draft conclusion is -- again this being a new questions to 2010. Our draft conclusion is that some evidence supports a positive relationship between the behavior of breakfast consumption and intake of certain nutrients in children, adolescents and adults. And this was assigned a Grade II. Very limited evidence supports a positive relationship between snacking and nutrient intakes in children, adolescents, adults and older adults, and this is assigned a Grade III. And inadequate evidence to evaluate a relationship between eating frequency and nutrient intakes, and so we didn't grade that particular part of this broader question of behavior.

Our search strategy. And unlike some of the other components of the nutrient

adequacy chapter, which really relied on evidence from dietary intake information, we did use the NEL search process to answer these questions. So, our strategy included looking at data from and papers from 2004 to the present. We did look at the international publications for individuals aged two years of age and older, and we didn't limit ourselves to study designs because of the nature of the question. We're really looking at the relationship for the association here.

Our search terms for the breakfast component of this are identified here. There were 79 potential articles identified. Sixty-four were excluded. So of the 15 studies that were reviewed, 11 were cross-sectional studies, two were prospective cohorts, one was a retrospective cohort study and one was a systematic review. The systematic review is not listed in this group of papers here, but provided a foundation. And we didn't then further review the papers

that were included in that review paper, and that was a paper by Rampersaud and colleagues. So the 14 that are listed here are those published after the publication data. That puts them out of review.

And so, we see that there were four papers addressing adults. The remaining addressed children and adolescents. You see the type of study.

Positive relationship here means that those who were consuming breakfast; and I'll mention a little something about breakfast and what that means in just a bit -- but those that were consuming breakfast were more likely to consume or were consuming, had reported higher intakes of the nutrients listed in that positive relationship column. So, you see carbohydrates, fiber, B6, calcium, iron, magnesium. Some of these nutrients are sort of all over the board here.

Negative relationship is those

that were consuming breakfast had lower reported intakes of PUFAs, MUFAs, *trans* fats in the first study. And as you move down, you see negative relationships just in a couple of other studies. And then no relationship was reported for breakfast intake and certain nutrients in a few of the studies as well.

When we look at snacking then, the search terms that were used are listed here. There were 53 potential articles, 46 were excluded. The reasons that these were excluded wasn't because of design, because we weren't looking for specific design, but because they simply did not answer the question of the relationship between nutrient intake and breakfast, snacking or eating frequency. So, that was the reason for the exclusion.

For snacking, we had seven studies, five cross-sectional, one prospective cohort and one retrospective study. And our findings here include papers for adults,

adolescents and a couple for children. Again, the positive relationship is those who were snaking had greater reported intake for carbohydrates, folic acid, vitamin C, calcium, magnesium, iron, potassium and fiber in the first Kerver 2002 article. And you can see the other relationships there that were positive.

Negative relationships. Those that were snacking had lower intakes of protein and fat in the Kerver paper. Cholesterol and iron in Stockman's study, and so on and so forth. And then no relationship with a couple of items here in that last column.

MR. GILBERT: Shelly, I'm sorry to interrupt. This is Nathan again. Is it possible to speak a little louder? We're hearing some people reporting they're having difficulty hearing again.

DR. NICKOLS-RICHARDSON: Yes, I'm sorry about that. I wasn't leaning toward the

phone as much, so --

MR. GILBERT: All right. Thank you. Much better.

DR. NICKOLS-RICHARDSON: Better?

MR. GILBERT: Yes.

DR. NICKOLS-RICHARDSON: Okay. Thanks for the reminder.

And then looking at eating frequency, our search terms that we used are listed here. Twenty-five potential articles. Twenty-two were excluded. And again, if you didn't hear me, the reason that articles were excluded was not because of study design. We have that pretty open to help answer this question, but because the papers then in fact did not address nutrient intake and the question at hand, whether it was breakfast, snacking or eating frequency.

So, for eating frequencies, again there were three cross-sectional studies. Two were positive, one was neutral, and we just didn't have enough data here to really come to

a conclusion.

So, our draft implications include that Americans are encouraged to eat nutrient-dense forms of foods and beverages for breakfast to facilitate achieving nutrient recommendations. And if snacking, the nutrient-dense forms of foods and beverages are suggested while staying within energy needs, and adding that phrase to be consistent with the energy balance implications related to behaviors.

There are limitations to these questions related to behavior. First of all, the definitions of breakfast and what a breakfast consumer versus non-consumer is were pretty disparate across the studies. Same for snacking. Mim did mention that there are better definitions now that have been defined in a recent paper. But eating frequency, there were inconsistent definitions here, and so it was a little bit hard to evaluate the studies because of that.

Also, methodological differences in how dietary intake was assessed, whether it was through food frequency or food records, or 24- hour recalls. Inconsistencies in the nutrients examined, so there wasn't a consistent set of we're going to be looking at these 13 nutrients or these 23 nutrients. It was across the board for individual studies. And there could be some publication bias, meaning that those studies that found those positive relationships were published, or the nutrients that were positive relationships were published within those studies.

The research recommendations here include perhaps forming a consensus panel on what's the definition of breakfast or breakfast skipping is, what snacking is and eating frequency; longitudinal evaluation of the cumulative nutritional risks and/or benefits from these three behaviors and perhaps others; and then evaluation of critical components of breakfast or snacks and

their health effect. So, is it really whole grains and high fibers in breakfast foods, for example, or is it something else? Are there health detriments because of refined and maybe sugar-sweetened cereals, and so on and so forth.

So, I'll stop there with the behaviors and see if there are questions related to behaviors and nutrient adequacy.

DR. APPEL: Shelly, this is Larry. I have a question. I'm wondering what the best approach is to this question about nutrient intake and breakfast. And just looking at that slide where you had mostly cross- sectional studies and, you know, positive relationships of certain nutrients with breakfast, it still doesn't get at the issue of whether they're achieving the recommendations in the DRIs. So, you could have a positive, you know, association, but still be falling short.

So, I'm wondering if the best way

to actually address this question; it might be too late, is actually modeling, where you say if somebody doesn't eat food before 11:00 o'clock or noon, and you try to get everything through lunch and dinner using the usual foods that people eat for lunch and dinner, can you meet, you know, nutrient requirements? And I would be shocked if you could. But anyway, that to me is the approach to the question rather than sort of the cross-sectional data that looks at just what people are currently doing.

DR. NICKOLS-RICHARDSON: Yes.

DR. PEREZ-ESCAMILLA: And, Shelly, this is Rafael. In terms of your nutrient adequacy and behaviors, breakfast, snacking and eating frequency implications, you talk about the need to encourage the consumers to eat nutrient-dense beverages. So, I was wondering if we needed a more specific definition as to what we mean by nutrient-dense beverages, because there are

all sorts of fortified drinks out there that --

DR. NICKOLS-RICHARDSON: Right.

DR. PEREZ-ESCAMILLA: -- could qualify, could meet this criteria. And I'm not sure that's what we want to recommend.

DR. NICKOLS-RICHARDSON: Okay. That's a great point, and we may come to you to ask about maybe energy-dense and how you're handling beverages also in relation to energy balance to make sure that we're consistent with how you're handling those beverages.

DR. PI-SUNYER: To go back to what Larry said, do you have time to model the no breakfast issue?

DR. NICKOLS-RICHARDSON: I'll certainly discuss that with Trish and see. I know we're really down to the wire here, and so we'll have that conversation. But intuitively, you know, again I can't say this from really looking at the data sampling, but intuitively I would agree with Larry that it's

harder to meet nutrient requirements if food intake doesn't happen sort of as a breakfast meal and only those foods that would typically be eaten at later times during the day are consumed. And some of those studies did try to get at that a little bit, so I will go back and look at those studies and try to pick up on those that actually carried that through for an entire day again to revisit that. But, I will definitely talk with Trish about the modeling question.

DR. PEREZ-ESCAMILLA: Shelly, Rafael again. In terms of how we handle energy, the beverages within energy density, the issue is that most studies have excluded beverages from the energy density estimations.

DR. NICKOLS- RICHARDSON: Right.

DR. PEREZ-ESCAMILLA: So, I'm not sure if that literature is going to be very helpful.

DR. NICKOLS-RICHARDSON: Yes, okay.

DR. NELSON: The only other -- this is Mim, about the beverages, I mean, can't we just say nutrient-dense foods? Do we need the beverages in there, or, you know, non -- I don't know. The beverage thing is a problem.

DR. PEREZ-ESCAMILLA: Unless we use milk.

DR. NICKOLS-RICHARDSON: Yes, and I think, you know, maybe from a breakfast standpoint, and again we had in some ways intended to look at food, so what are the breakfast foods in relation to nutrient intake, and we weren't quite able to do that. But thinking about some of the studies that did have foods, the reason the beverages become important at breakfast is really because of the 100 percent juice, you know, being part of that meal, the likelihood of that being consumed at the breakfast quote unquote meal. So, that's why beverages was inserted in there, but, you know, it does

raise some questions and issues. So, I want to capture that those are nutrient- dense foods that are consumed at a breakfast meal, however you define that, that do contribute to nutrient quality and adequacy of the diet, but I think we can think about how to best phrase that and include those foods.

DR. VAN HORN: This is Linda, and I'm just looking at the clock. And I would like to just suggest that we push on so that we can take a short break and then start in.

I would also like to just let everyone know that we will probably shorten our lunch break so that we can get caught up a bit. And also, I'm guessing that by the end of the day we will probably have a relatively short discussion of the dietary patterns issue because we really want to pay attention to some of these really more, you know, current issues that are in full development.

So, Shelly, with that, if you can push through and finish this presentation,

that would be great.

DR. NICKOLS-RICHARDSON: Okay --

DR. RIMM: This is Eric. I also cede 30 minutes of my alcohol time to Shelly, because this is much more interesting.

DR. NICKOLS-RICHARDSON: Really?

DR. VAN HORN: We'll drink to that.

All right. Go ahead, Shelly.

DR. NICKOLS-RICHARDSON: Okay. And actually at this point, the last couple of pieces here -- and again, thank you for giving us the extra time here. The last couple of pieces are really related to modeling exercises, and I'm going to turn this over to Cheryl to talk about starchy vegetables.

DR. ACHTERBERG: Thank you much. This presentation I think will begin to give the Committee some sensibility, if we start rearranging food groups, actually how complex that exercise is.

In this particular modeling

exercise we asked two questions: How do the nutrients provided by the starchy vegetable subgroup compare with those provided by grains and other vegetable subgroups, specifically looking inside the one food group; and then, how would nutrient adequacy of the pattern be affected by considering starchy vegetables as a replacement for some greens?

Next slide. To provide some background, in the 2005 Dietary Guidelines for Americans the suggested number of servings for vegetables was increased primarily to increase potassium intake such that now on a 2000-calorie diet you can see the dark green vegetables, the recommendation is three cups per week; for orange, really that's red-orange, two cups per week; for dry beans, three cups per week; starchy vegetables, then three cups for week; other vegetables, six-and-a-half cups per week. What that translates into on a daily basis is about two-and-a-half cups of total vegetables per

day, which you know by looking at the previous slides this morning, virtually no Americans are consuming.

Next slide. For further background, and this question was raised yesterday, how are starchy vegetables defined? In rank order of consumption here in the U.S. it's potatoes, yellow and white corn, green peas, immature lima beans, cow peas, field peas, black-eyed peas, pigeon peas, cassava, taro, burdock root and white yams. Out of this entire subgroup, by far the largest component consumed in this country in this starchy vegetable subgroup is potatoes. And looking at the potato consumption more specifically, there are five item clusters. Boiled, baked, French fried, potato chips and puffs, and home fries and hash browns. So, together they make up 80 percent of the starchy vegetable consumption. I would add that boiled potatoes by themselves make up just over a quarter of the consumption, 26

percent. But if you add the French fries and the chips together, that would be 37.3 percent of consumption of potatoes.

Next slide. So, again I want to emphasize that the food patterns here are set by the USDA. So, realigning vegetable subgroups has been already completed by USDA with the purpose of providing guidance for more achievable vegetable intake by Americans. And that specifically refers to the red-orange vegetable subgroup. This realignment suggested increase intakes of vegetables from the starchy vegetable subgroup, of concern due to the higher intake of potatoes in the forms we identified.

Starchy vegetables, looking at them with a macronutrient profile, they are more similar to grains as recognized by other organizations like the American Diabetes Association. If you reflect on the AICR report, starchy vegetables were grouped with grains, and typically that's done in Europe as

well.

Next slide. So, in this case we conducted a modeling analysis to compare the nutrient contributions of starchy vegetables to those of other vegetable subgroups and to grains to investigate changes in nutrient adequacy of the patterns if starchy vegetables were considered as grain replacements rather than as vegetables. And to identify how those recommended intakes might compare to the median intakes and the 95th percentile intakes for various population groups. In other words, we wanted to find out if these changes might be feasible.

Continuing with methods, in a step wise fashion, this gets fairly long and complex, so bear with me.

First, we compared the amounts of the selected nutrients in a standard amount of each vegetable subgroup and the grain subgroup, then identified the nutrients in the patterns provided by the currently recommended

amounts of starchy vegetables and calculated the increased amount of the dark green, red-orange and other vegetable subgroups that would be needed to bring that total vegetable recommendation up to current levels. If we take out something, we need to increase the others to fill in behind it if starchy vegetables were considered as a grain replacement rather than as a vegetable.

Okay. Next slide. Calculate the decreased amount of whole and refined grains that would be needed to maintain current recommended intakes of grains with starchy vegetables counted as a grain replacement. In other words, shifting looking at [inaudible] -- then test the impact on nutrient adequacy of potential modifications in the patterns with starchy vegetables replacing some grains and three vegetable subgroups increased proportionately. And finally, identifying how the amounts of the vegetable and grain subgroups compared to the usual intake

distributions with the potential modification.

Next slide. Results. The first set of methods were to try to figure out what serving size group comparisons if we're shifting foods from one group into another that we use, and concluded that a two ounce equivalent portion of a grain serving is equivalent to one cup of starchy vegetables, which is also equivalent to one serving, one cup equivalent of fruit. So, in other words, the shifting is one cup of vegetables, or for that matter fruit, is equivalent to two ounces of grain. Doing that then and looking at the nutrient profiles compared to grain, starchy vegetables are similar in energy content, similar on fiber, magnesium, phosphorus and niacin, but also somewhat lower in protein, calcium, iron, thiamine, substantially lower in selenium and dietary folate and substantially lower in potassium and choline.

Next slide. More specifically, looking at the nutrients provided by starchy

vegetables in the USDA Food Intake Patterns, starchy vegetables now contribute about six percent of the total energy, 13 percent of potassium, 10 percent of thiamine, 10 percent of B6, nine percent of fiber, nine percent of copper, eight percent of magnesium, eight percent of niacin, seven percent of vitamin C and seven percent of sodium. Again, we want to underscore this is in their most nutrient-dense form.

Next slide, the proportional substitution of other vegetable subgroups for starchy vegetables and the substitution of grain for starchy vegetables resulted in these recommended changes: An increase of .14 cups of dark green vegetables; an increase of .28 cups for red-orange vegetables; an increase of other vegetables -- we're thinking there of things like eggplant, mushrooms, a whole variety of other vegetables, plus .29 cups. And that's based on current consumption patterns to compensate for moving or adjusting

those starchy vegetables. That's taking out almost three-quarters cup if we shift them to the grain group.

We intentionally left the legumes unchanged. Obviously theoretically they could be included in the change here, but given the fact that American consumption of legumes in general is so low, we didn't want to try to increase that any further and therefore make this modeling result in something that would not be feasible in practice.

Whole grains, on the other hand, declined .71 ounces, and refined grains also .71 ounces. Because we're trying to equate the refined and the whole grains, as suggested earlier, and increase or replace that with 1.42 ounces of starchy vegetables in the grain food group.

Next slide. Then we wanted to determine what is the impact of these changes on the nutrient adequacy of patterns. Overall we concluded that the total impact was pretty

minimal. Based on a 2000-calorie pattern, the largest changes of percent of goals were: A decline of 10 percent for vitamin B12; decline of 13 percent in carbohydrates; and incidentally, that's about 90 calories; decline 14 percent in selenium; 14 percent of folate, 14 percent of thiamine, but an increase because starchy vegetables in their naturally occurring forms are in fact nutrient-dense, an increase in vitamin E, 14 percent; vitamin C, 23 percent; and vitamin K, 60 percent.

So the comparison of amounts of vegetable subgroups in revised patterns back to median intake and 95th percentile of usual intakes, there were some fairly divergent patterns. For dark green vegetables, that revised recommendation produced by this modeling is far above median intake for all groups and exceeds the 95th percentile of intake at that level.

Similarly for red-orange

vegetables, the revised recommendation is no more than four times the median intake for any age/sex group and it's above the 95th percentile for all groups.

Again, legumes we left unchanged. Our current food patterning recommendation is three to seven times the median intake, but within the 95th percentile intake for all groups.

Starchy vegetables, again as a subgroup, unchanged in terms of total intake, but if we count them as grains, the recommendation is two to three times the median intake, but within the 95th percentile for all age/sex groups.

And then looking at the last subgroup, other vegetables, the revised recommendation is no more than three times the median intake but above the 95th percentile of intake for three of five age/gender groups evaluated.

Next slide. In sum, our draft

conclusion states that is possible to use starchy vegetables as an alternative to grains rather than as a subgroup within the vegetable group with relatively little impact on nutrient adequacy as long as additional amounts of other vegetables, including dark green, red- orange and other vegetables, are used to replaced the starchy vegetables counted as grains. These additional vegetables should be substituted equally, one cup for one cup, with starchy vegetables that are counted as grains. With this change, the amount of grains, whole and refined, must be decreased by two ounce equivalents for each one cup equivalent of starchy vegetables. That's just to underscore that it's a substitution, not an addition to that green group.

Further, one cup equivalent of starchy vegetables can replace or substitute for a two ounce equivalent of grains. For each cup of starchy vegetables that's counted

as grains, dark green, red-orange or other vegetables should be increased by one cup to meet vegetable group recommendations. Consumers should not increase intakes of both starchy vegetables and grains. In all cases to meet nutrient adequacy goals within caloric limits vegetables and grains selected should be in their nutrient-dense form rather than in forms with added solid fats, sugars or salt.

This model represents, finally, an alternative dietary pattern for consumers who have an interest in carbohydrate exchanges. It will be challenging for many if not most Americans in terms of meeting vegetable consumption; that is, holding calories.

Thank you. So, I think if we're going to have any questions about this section, this would be the time to do it.

DR. RIMM: This is Eric. Cheryl, that was really very clear. Thank you for walking us through that.

I'm sure there was some thought

about this, and I know that Linda and I and Joanne have been harping about this for the last year and a half, just the issue of it. You know, in this modeling you would be concerned about the loss of fiber, only because you're reducing the grains. Was there any discussion of just within the starchy vegetable group just increasing vegetables and decreasing the potato starchy vegetable?

DR. ACHTERBERG: Well, as you know, the concern is that our general advice has been for Americans to eat five a day, and then Americans generally choose which vegetables they're going to eat, and potatoes are among the most common vegetables consumed. And with our concern in this particular set of dietary guidelines about calorie intake, we thought it would be useful to see if we looked at things from a different perspective, what would that result in, in terms of us providing advice.

DR. RIMM: It seems like it's sort

of a -- I mean, what we're really trying to say is eat more of the, you know, dark green and red and other vegetables, red-orange vegetables. It seems like that's the problem, as you have stated it, that we've said people should eat five servings of vegetables and they're choosing potatoes. The issue is that we want them to eat fewer potatoes and eat more of the other vegetables. I don't know if this is just sort of an alternative to what we really want to say. I know it's -- it's just maybe that if we say it more clearly and really, you know, specify what we think is the right thing to do, then again people creating institutional meals and school lunches and things like that would have to live up to this higher standard as opposed to shifting potatoes and reducing whole grains.

DR. ACHTERBERG: Well, remember, it might be reducing refined grains as well. So, it's two issues. It's the one issue that you've raised, we want people to eat more of

certain kinds of vegetables than they do at present, but also that other aspect that the starchy vegetables are really different in their macronutrient profile, and that profile is more similar to grains than it is to anything else. And for many Americans, they really want to be able to use exchanges and we needed to figure out how would using those exchanges work against the USDA Dietary Patterns? What kind of advice could we give people that hadn't been done before? We needed to go through the exercise. It is of great interest to many Americans. So, there's really more than one purpose here.

DR. VAN HORN: But I think Eric's point is, you know, well-taken, that just as we've been saying all along -- and again to the average consumer, this list even would be in code. I mean, we nutrition people understand what we're talking about when we talk about starchy and red and orange and all of that, but they want to hear carrots, you

know, and actual broccoli. I mean, terms and ideas about what it means to include the kinds of vegetables that, you know, really need to be added and involved in terms of the average diet.

So, especially seeing, you know, all of Shelly's slides and seeing how under-consumed a lot of those vegetables are, and the fact that we keep advocating again dietary sources of shortfall nutrients like folate coming from the green vegetables.

So, I think once again this is just an opportunity to help clarify rather than confuse or, you know, dissuade people from filling in with the vegetables of highest, you know, order in terms of their nutrient density while maintaining and reducing excess of caloric intake. And I think that's really part of it. But, I think, you know, this is definitely getting in the right direction. We just would encourage, I guess, this group to take another look at how

to make sure that one message doesn't overshadow the other.

DR. ACHTERBERG: Right, we want people to eat more of the green, red and orange vegetables, and we also want to give people more flexibility in figuring out how they can meet the guidelines and recommendations we present. So, I think as opposed to some of the work in the past, this provides people with more options, and I honestly believe that's important, too.

DR. APPEL: This is Larry. I have a question for you. I didn't see this; and maybe I missed it. I mean, you presented a list of starchy vegetables that are in this category, but when you did the modeling was it -- I just want to make sure that we don't leave this section and say, oh, it was all potatoes. I imagine it was a whole array of starchy vegetables of which potatoes might have been some percent.

DR. ACHTERBERG: Right. Again,

boiled potatoes were 26.5 percent; baked, 13.2; French fries were 18.2; potato chips were 19.1 percent; and hash browns 6.5 percent. So, the potatoes really dominated. But then corn, yellow corn was 8.3 percent; hominy, grits, white corn, 1.7 percent; green peas, 4.1; lima beans, .6; cow peas, field peas, black-eyed peas, pigeon peas together, .5; water chestnuts were --

DR. APPEL: So, that's a pretty tiny --

DR. RIMM: Yes, but the potatoes were 80 percent. That's what she had on one of her slides. So, it's almost essentially potatoes.

DR. APPEL: So, the modeling was done keeping that rate, the distribution the same then?

DR. ACHTERBERG: Yes. We thought was important to do.

DR. PI-SUNYER: So, that's what makes sense in the sense that if you're going

to change, you have to use the foods that people are eating at the time.

DR. APPEL: Yes, but I would think that the distribution could shift if we're trying to encourage more nutrient -- or starchy vegetables with I think a more desirable nutrient profile. That's clearly, you know, a debatable issue.

DR. ACHTERBERG: Yes, when you model, obviously you get to make choices, but then when we make recommendations, it might be presented differently.

DR. NICKOLS-RICHARDSON: I'm going to move on and keep us pressing forward here. So again, I apologize for going way over our time now. I'm going to try to do this really quick.

So, Trish, as you're moving through slides, I'm going to bounce across a few slides here since everyone has these really in their notebooks.

So, this final modeling piece is

really looking at vegetarian or plant-based diets. And so, the question asked here is how well do plant-based or vegetarian food patterns adapted from the USDA Food Patterns meet our recommendations for nutrients?

So, three different plant-based vegetarian- type patterns were modeled. The first was a plant-based diet in which more than 50 percent of all protein came from plant sources. The second was a lacto-ovo vegetarian diet in which only milk and egg products from animal sources were included. And then a vegan diet in which no animal products were included.

Here I'm going to jump and just cut to the quick here. There is a method slide; Trish, if you want to hit the method slide here, looking at sort of the patterns and how they were modified. Again just reiterating that plant-based, 50 percent of all protein from plant sources, lacto-ovo vegetarian, eliminating all meat, poultry,

fish and an increase in nuts and seeds, processed soy and legumes to compensate for the removal of the meat, poultry and fish, and then vegan, eliminating all of those animal-based products. An iterative process to again identify the best meaning of nutrients within caloric limits and looking at adequacy of the nutrient profile.

I'm going to flip to the results, so these two slides that have tables. This is just showing you then how those patterns sort of played out, but the results are the important part. And what we find is that for most nutrients nutrient adequacy is not affected. Nutrients are still adequate but amounts that are lower in the plant-based approach is protein, zinc and selenium. Those that are higher in the vegetarian-type patterns include carbohydrates, dietary fiber, iron, but keeping in mind that those are the lesser bioavailable sources of iron, magnesium, vitamin E, folate, potassium,

calcium and vitamin D. Choline is lower, but again in the base patterns anyway, this is under the AI. For EPA and DHA the amounts are lower, especially in the vegan pattern, so fish is removed from that pattern. Then we have inadequate EPA and DHA, but the amino acids all meet the RDAs in all of the patterns.

So, the summary here for looking at really plant-based vegetarian-type of eating, the base USDA Food Patterns can be adapted for use as a guide to healthy eating by those who want to consume more or only plant-based foods with little impact on nutrient adequacy, but keeping in mind that the way these patterns were modeled may not actually be perfectly aligned with how people who say that they are vegetarian-type eaters truly eat. So again, these were modeled after what our best knowledge and best information is about what a vegetarian diet is. Choices of plant foods should include foods that pay

attention to B12, vitamin D and calcium, and then other nutrients that might be concern if those animal products are removed include choline, EPA and DHA.

The last slide that we have here is just really I think to let the general public know and understand that we are listening and reviewing their comments. Obviously, you've seen here in this presentation related to nutrient adequacy that we have looked at flexibility in eating patterns viewed by the vegan/vegetarian, the starchy vegetable modeling. Food processing is a comment that comes to us time and time again, so again I think the comments about having food manufacturers work with us, work with all of us so that Americans can follow the guidelines that are presented to them that are based on the best science that we've been able to review to get the sugars and the solid fats and sodium in foods lower so that Americans can better follow guidelines. And

then food groups, again looking at starchy vegetables, a lot of comments about emphasizing whole grains, fluid milk, dry beans and peas. And so, we are paying attention to your comments and trying to address this the best that we can with the science-based and our dietary intake data.

So, I'll open it for any final questions, comments, concerns about nutrient adequacy and where we are with this part of the report.

DR. VAN HORN: Excellent job, Shelly, and the whole Committee. This is a huge, huge amount of work and covers a tremendous amount of territory, but obviously all of it is very important and is probably the unifying chapter of everything else that we're saying. So, thank you so much for all this hard work and all to the staff as well.

Comments from people? We've sort of covered a lot of territory already, but there may be some additional final points

people would like to make now.

DR. PEARSON: So, this is Tom Pearson. So, relative to the woman who is pregnant or lactating, this is obviously targeted at a healthy general population, are you going to be making any comments about that relative to these diets?

DR. NICKOLS-RICHARDSON: Specific to the modeling or specific to just the whole Dietary Guidelines relating to pregnancy and lactation?

DR. PEARSON: I think relative to I guess the modeling that would be related to those specific instances. I just wondered if you were going to comment on that particular population subgroup, particularly with -- the EPA and DHA are obviously something that we were concerned about.

DR. NICKOLS-RICHARDSON: Yes, okay. And so, in relation to vegetarian/vegan eating, certainly I think we can put a cautionary note for pregnant and lactating

women related to nutrient shortfalls that would be inherent in that type of eating. We can certainly do that.

DR. VAN HORN: Anything else from anyone?

(No audible response.)

DR. VAN HORN: Okay. I would like --

DR. PI-SUNYER: I would just --

DR. VAN HORN: Oh, sorry. Go ahead.

DR. PI-SUNYER: This is Xavier. I just wanted to ask Cheryl, are you going to put this in as something that you want to do, to switch this over?

DR. VAN HORN: Is Cheryl still there?

DR. ACHTERBERG: Can you hear me?

DR. NICKOLS-RICHARDSON: This is Shelly. I'll take a stab at that.

DR. ACHTERBERG: I'm here.

DR. NICKOLS-RICHARDSON: Oh, there

she is. Okay.

DR. ACHTERBERG: I'm sorry I didn't come through. As I understand it, it's not our call per se, but we could make suggestions or recommendations. And I think the recommendation we're suggesting at this point in the draft report is to consider presenting it as an option that some Americans might consume to follow a dietary pattern based on this adjustment and others wouldn't.

DR. PI-SUNYER: Okay. So, you would give specific instructions about that?

DR. ACHTERBERG: Well, I think when the Dietary Guidelines come out, USDA would give instruction. We can suggest in this report whether or not they should or shouldn't do that.

DR. APPEL: Cheryl, this is Larry. And I've been working on another section, dietary patterns, that might be close to what you're getting at. I think we're planning on presenting, in contrast to 2005, several

dietary patterns that appear to have nutrient adequacy and also several dietary patterns that have health benefits. And so, I think the three -- I didn't realize it until I saw this slide deck. In this chapter we're thinking about presenting four different dietary patterns based on the modeling that the USDA has done. So, the plant-based, the lacto-ovo and vegan, providing documentation that it can be done.

DR. VAN HORN: Right.

DR. APPEL: And then how it gets done I think is going to require the translation step.

DR. VAN HORN: Right. I think the points that are being made are very important and yet also attest to the need for some flexibility in letting consumers make some choices on the basis of, you know, what they're trying to accomplish. So, I think just as Larry points out, the hope is that within this total diet chapter some of those

kinds of alternatives will be presented to people as approaches, you know, that they can take to try to meet all of these goals and mix and match as needed.

DR. NICKOLS-RICHARDSON: This is Shelly. If I didn't mention it before, yes, these last two modeling pieces will be part of the total diet chapter and not specific to nutrient adequacy. It's just it fell within our group to look at it, so it makes sense to include it in total diet and that flexibility.

DR. VAN HORN: Right. With that, I guess I'd like to break in at this point. We've all been glued to our computers for over three hours. I think we all desperately need a little break.

But I have communicated with Larry and I haven't heard back from Eric, but I'm hoping that perhaps what we might do is modify this schedule a bit, and Eric graciously offered up a little of his time. And I wondered if we might not at this time take a

very brief 10- minute break, come back and let Eric do his presentation expecting that we will then break for lunch right around 1:00 Eastern Time and try to stick with a fairly abbreviated lunch, and start back again at maybe 1:40 so that we can try to catch up a bit. And as I said, I know that some of the discussion at the end has already been addressed in some ways, so we may make up time at the end. But I think this might be better than breaking into Larry's presentation mid-stream.

Would that be all right with the staff and with Eric?

DR. RIMM: That's fine with me. It would only be if the public has the schedule and, you know, the four people that were interested in the alcohol that may be on are chiming in at 1:30 and see that I'm done, you know?

DR. VAN HORN: Yes, that is a problem.

DR. RIMM: I don't know. Was the schedule already put out there? Is that open to the public? Probably is, right?

DR. VAN HORN: I don't think so, but I don't know. And I don't see any feedback from anybody, so I don't know how to answer that question.

DR. RIMM: Yes, it's possible that -- I mean, since it's being recorded, people can always get it anyway, but I just wanted to bring that up in case it was problematic. Maybe Rob or someone else can speak to that.

DR. VAN HORN: Okay. I'll tell you what, why don't we take a 10-minute break now, and when we come back either Larry or Eric will start down the road. And we'll find out if it's possible to move you earlier. All right?

DR. APPEL: Yes, this is Larry. I don't mind, you know, if mine needs to get broken up. I might be able to do it in 40 minutes, or it might take longer, and finish

up after the luncheon break.

DR. VAN HORN: Okay. That's fine, too. I just hated to interrupt you. I just don't think it's --

DR. APPEL: We could figure out a break, I mean, you know?

DR. VAN HORN: Yes. Okay. So, why don't we officially take our break at this point for the next 10-12 minutes, and be back by 12:30, please. Thank you.

(Whereupon, at 12:14 p.m. off the record until 12:30 p.m.)

DR. VAN HORN: Welcome back, everyone. Thank you for your cooperation as we try to really do justice to the content of this meeting and all these wonderful reports.

We've decided to make a mid-course adjustment, and our next presentation will be made by Eric Rimm in regard to the Alcohol Subcommittee. Our plan is to present the report and then take our lunch break at 1 o'clock or whenever Eric is finished. And

then abbreviate lunch somewhat and be back by 1:40 or so with Larry Appel's presentation on sodium, potassium and water. So, we appreciate your understanding and cooperation.

And with that, Eric, take it away.

DR. RIMM: Thanks, Linda. So, I'm presenting this on behalf of the subcommittee presented here. I also, too, would like to thank you colleagues at HHS and the USDA for being very helpful and doing these searches and helping us get through a lot of changes in our questions along the way.

So, if I could go to the next slide? So, the final three questions that we would like to address today and present to the Advisory Committee are on alcohol and bone fractures and bone health, alcohol and unintentional injury, and finally, alcohol and breast- feeding.

Next slide. So, for bone fractures and bone health, the question we put forward was among persons who consume

alcoholic beverages what is the relationship between patterns of alcohol intake and bone fractures and bone health? And for this, we went back to 1995, focused only on adults of legal drinking age, since that's where the Dietary Guidelines would cover. And also outcomes included in our search included bone fractures and bone density.

Next slide. Our proposed conclusion based on Grade II moderate evidence is that there is a moderate evidence to suggest a J-shaped association between alcohol consumption and incidence of hip fracture. And compared with accidents, consuming one drink or less per day is associated with a lower risk of hip fracture. This may reflect a positive linear association between alcohol consumption and bone density. However, at greater than two drinks per day, alcohol consumption is associated with a higher risk of hip fracture. This may result from both acute effects on balance and long-term effects

on bone density.

Next slide. For this, we started to do a thorough review and came up with a very nice systematic review, a recent systematic review/meta-analysis of 33 studies and thought that this adequately captured the preponderance of evidence, but we didn't think it was necessary to do further NEL search just within the last six to twelve months. This meta-analysis covered 13 studies, eight prospective, five case control, and concluded that there was a J-shaped relationship between alcohol consumption and hip fracture. Four cohort studies rated showed a linear association between femoral and neck bone density in alcohol consumption. Studies often combined moderate and heavy drinkers into a single category, therefore we could not assess relative association between alcohol consumption and bone density in the moderate compared with heavy drinkers.

Next slide. So, the implications

for this is that there is insufficient evidence related to patterns of alcohol intake and bone health. If you recall from my past presentations, we've been trying to sort out whether we can look at specific patterns versus just giving guidance on average consumption, and there were not enough studies that looked at patterns. Obviously, when we talk about very heavy consumption on one single day, there was the increased risk of imbalance and bone fractures. Also, study limitations frequently included combining the moderate and heavy drinkers in the same category and failing to control adequately for physical activity, so that also meant we could do less with patterns of consumption. And there are only limited data are available that address changes in markers of bone health and metabolic studies of alcohol consumption, therefore this would be folded into a research question.

Next slide. For unintentional

injury we also wanted to look at among persons who consumed alcoholic beverages what is the relationship between patterns of alcohol intake and unintentional injury. And for here we went back to the mid-1990s to present, again looking only at adults of legal drinking age. And for outcomes we included a broad range of outcomes including accidents, accidental falls, home accidents, occupational accidents, wounds and injuries, alcohol drinking and adverse effects. And for this, because some of them were acute events, we made the decision to include cross-sectional studies.

Next slide. For here the proposed conclusion with Grade I evidence is that among persons who consume alcoholic beverages there is substantial evidence to suggest that drinking in excess of current guidelines increases the risk of unintentional falls, motor vehicle accidents and drowning. And although the evidence of risk of unintentional

injury is not as well established in alcohol consumed in moderation, abstention from alcohol is likely the safest level for occupational activities and other activities such as driving motor vehicles of any type, swimming and participating in athletics. We actually put swimming in here (I think it was not in past guidelines) only because there have been several studies looking at unintentional injury from drinking and swimming.

Next slide. For here we looked at the review of the evidence. There are 22 studies. Five of them are systematic reviews, seven cohort studies, five case control studies, a longitudinal study and several other study types. Most of the studies were of neutral quality, two were positive and one negative. But for the most part there was pretty clear evidence of unintentional injury at alcohol consumption beyond moderation, and even in many of the studies when alcohol is

consumed in moderation.

Next slide. So, the implications for this and sort of folding in future research is that we think that in this area there should be a focus on effective communication policies that reinforce and expand the current messages on drinking and driving to inform individuals of the potential risks of alcohol consumption in the setting of other activities.

Next slide. So finally, our final question was what is the relationship between alcohol consumption and lactation, and this was one of the major questions, and we had two sub- questions underneath this. What is the relationship between alcohol consumption and the quantity and quality of breast milk available for the offspring? And the second question was what is the relationship between alcohol consumption and post-natal growth patterns, sleep patterns and the psychomotor patterns of the offspring?

This was I guess a question that came out of comments we had gotten from several groups suggesting that women were giving up breast- feeding because they wanted to have a drink. So, we wanted to address this with the knowledge going in that clearly breast-feeding is the best thing for the new child, and so we wanted to see if there was a conflict between this or if there would be a specific guideline we could give to women who are interested in having an occasional alcohol-containing beverage and also want to continue breast- feeding their child.

So, because of this, we sort of left it open. There was no date range. We searched for all available evidence, again using 21 years and older and looking at all study designs to see if we could get a sense of the data, and those are the different outcomes we used in the search. We also did some hand searching and talked to an expert in the field, actually I think the expert in the

field, when making up these conclusions.

Next slide. So, for sub-question 1, we have a Grade II conclusion. When a lactating mother consumes alcohol, alcohol enters the breast milk and the quantity of milk produced is reduced, leading to reduced milk consumption by the infant. This is only while alcohol is in the blood stream, and therefore it's really a temporary alcohol in the milk, but it does match the alcohol in the bloodstream.

Conclusions at Grade II, limited but overall insufficient evidence suggests that the alcohol consumption during lactation is associated with post-natal growth, sleep patterns and the psychomotor patterns of the offspring.

Next slide. So, for the sub-question 1, review of the evidence, the conclusion is based on the review of 13 studies. Six studies examining the effect of alcohol ingestion during lactation on quality,

sort of the impact of the physical properties or chemical composition of the break milk produced. Seven within the subject design studies addressed the impact of alcohol consumption during lactation on the quantity of breast milk produced or consumed.

For the most part, these were very small studies done on 10 to 20 women where they -- obviously it would be difficult to do this type of study, where the mother was given alcohol on one occasion and then the child was monitored. And then alcohol was not given on a second occasion and the infant was monitored in terms of the amount of alcohol they were consuming. In most cases, the amount that the woman produced was less and the amount that the infant consumed was less, although in subsequent feedings the infant made up for it as long as the mother was not drinking.

Next slide. So, for sub-question 2, our conclusion is based on the review of five studies examining the relationship of

mothers' alcohol consumption during lactation on growth, psychomotor development, and wake and sleep patterns. For here, the psychomotor development, there really was I guess mixed evidence where the first study of '89 found differences. A subsequent study by the same office tried to validate that and did not find the same evidence of psychomotor development changes. So, that one is I guess more equivocal.

The wake and sleep patterns, it has been looked at again in a very small number of studies, but they do see that the child that sleeps after breast-feeding, when a small amount of alcohol is consumed, does not sleep as well as the child that consumes breast milk without alcohol.

Next slide. So, the implications I guess are really more of the meat of this. The first implication is the level of alcohol in breast milk mirrors the mother's blood alcohol content, thus it is not sufficient for

a woman to express breast milk after alcohol consumption to prevent exposure to the infant.

The benefits of breast-feeding to the infants are well established. A woman who chooses to breast-feed however need not completely abstain from alcohol. Instead, if the infant is of adequate age and mother chooses to drink, she should wait for three to four hours after a single drink before breast-feeding to ensure that exposure of alcohol to the infant is negligible. Actually, these are proposed implications. I would like to put in here that the alcohol should be consumed with meals. There were a few studies suggesting that the blood alcohol level obviously was lower if it was with meals, as was the alcohol content in the milk.

And here we wanted to just emphasize that if a woman does choose to drink one drink, that this is defined as 12 ounces of regular beer, five ounces of wine and one-and-a-half ounces of 80-proof distilled

spirits.

A third implication is contrary to medical and cultural folklore alcohol consumption does not enhance lactational performance, and instead reduces milk production and decreases infant milk consumption in the three to four hours after alcohol is consumed by the mother.

And finally, although there is insufficient evidence to conclude that alcohol consumption during lactation affects the post-natal growth of the child, we still felt that breast- feeding infants should not be exposed to alcohol.

I believe that is my last slide. So, as promised, I was less than an hour, but I'd be happy to take 10 to 20 minutes of questions if they do exist.

DR. VAN HORN: Thank you, Eric. That was excellent.

How about other members of your Committee? Does anyone have anything to add?

DR. ACHTERBERG: I'll just thank you, Eric; this is Cheryl, and I learned something in terms of bone fracture. What I'm curious about is looking at the data about alcohol consumption and patterns, when you talked about patterning. Did you look at binge drinking per se and the effects with binge drinking versus other patterns of intakes?

DR. RIMM: We have done that for other outcomes like heart disease and stroke. Most of the fracture data, as you would expect, there are a few studies that have looked at emergency rooms, people coming in with fractures, and, you know, I think our guidelines already tell people not to binge drink. So, it's clear that there is unintentional injuries, some of them fractures, associated with drinking in excess, well below even the level that we would call binge drinking. And we could come out with a stronger statement saying don't binge drink

because it's going to cause bone fractures, but we already I think sort of conclude that throughout. Was that why you were asking the question?

DR. ACHTERBERG: Yes, basically. Thank you.

DR. RIMM: And I think there are fewer studies on bone fractures per se than there are for I guess our section on unintentional injuries where there is evidence on binge drinking.

DR. NELSON: Eric, this is Mim. Just a quick question. It's more just an editorial one, because your proposed conclusion is a Grade II moderate that there's moderate evidence to suggest a J-shaped curve association between alcohol consumption and the incidence of hip fracture, yet your implication doesn't mention that. I think you might want to just -- you talk about there's insufficient evidence -- talk about patterns. I think maybe in the implication there should

just be that, you know, bring back your conclusion and how the implication should be basically repackaged here in implications. Otherwise, when I just read your implication slide, it looks like there's no evidence, or that we shouldn't do anything about it.

DR. RIMM: Yes, I guess it is. So, we're sort of mixing our conclusions of average alcohol with patterns of alcohol. So, maybe I can just put the implication related to patterns either at the bottom or --

DR. NELSON: Yes.

DR. RIMM: -- describe it better. Yes, I could --

DR. NELSON: I think that would be greater, because otherwise it looks like there's no evidence and you presented it. It's more of an editorial issue.

DR. PI-SUNYER: Eric, this is Xavier. With regard to having the alcohol with the meal, could you also say that you could have it just before the meal? Some

people want a cocktail before meals.

DR. RIMM: Specifically for the breast- feeding mother? That's what that was related to.

DR. PI-SUNYER: Yes.

DR. RIMM: Yes. In fact, the way that -- I'm trying to recall the studies. They're not huge studies, but that's not the way they were tested, and they actually -- let's see, they did the -- no, they did the alcohol before the meal and after the meal. That actually is the way they tested them. So, yes, I can just say, you know, around the time of meal consumption, or something like --

DR. PI-SUNYER: Right.

DR. RIMM: Yes.

DR. PI-SUNYER: I think that would be better.

DR. FUKAGAWA: I think the important thing is in terms of what blood levels are achieved in the mom that would be related to, you know, when and what she

consumes with the alcoholic drink. And that's sort of what you were trying to address, wasn't it?

DR. RIMM: Yes. I mean, again, there's not a ton of data. There's a few modeling papers and a few papers where they actually looked at the blood alcohol of a mother. And most of the time, you know, by four hours the blood alcohol is down to zero, even if alcohol is consumed on an empty stomach, just as long as it's one drink. So, what we're talking about is sort of between three and four hours, depending on if alcohol is consumed with the meal or on an empty stomach. Yes, so ideally, regardless of if you're a lactating mother or if you're, you know, somebody else, it's better to consume alcohol with a meal.

DR. VAN HORN: Other comments?

(No audible response.)

DR. VAN HORN: Eric, I was actually trying to remember, and just remind

me, in your last presentation at our last meeting did we go over the food patterning issues related to, you know, again, the equivalent of alcohol for an adult is sort of those added sugar calories for a child, I guess. And it would just be interesting, and I think this was suggested, but I don't remember, you know, to be able to provide some guidance regarding incorporation of alcohol into a diet that otherwise meets, you know, the nutrient needs and making it possible in terms of both energy and nutrient density. I just wondered.

DR. RIMM: Yes, that's a really important question. Thanks.

In the past meeting I did touch a little bit at first on drinking patterns in this country and the percent of people that were at different ranges. And then thanks to Patricia Guenther and a few others, Shanthy Bowman and a few others, I did present some of the data on alcohol and differences in diets

among people who drink. And Patricia just published a paper two weeks ago or a month ago with Roz Breslow and colleagues pointing out differences in dietary patterns among people who drink or don't drink. And in fact, that will be then something that we've written into the chapter. It's right early, you know, high up in the chapter noting that individuals who drink, you know, typically may have a slightly different type of dietary pattern and a slightly lesser dietary quality, and so they need to be cognizant of the fact that they're drinking. They need to, you know, be very careful about their diet quality.

DR. WILLIAMS: Eric, this is Christine. I just had a side question. I wonder about that three to four hours after a drink when alcohol is cleared from breast milk. Is that similar for caffeine, do you happen to know?

DR. RIMM: Clearly different enzymes are involved. Yes, you caught me

there. I'm actually not sure how quickly caffeine is metabolized.

DR. PEARSON: I don't think it would be the same because of the solubility of alcohol versus methylxanthines.

DR. RIMM: Roger should know the answer to this.

Roger, you know the answer to this? I don't know.

DR. RIMM: Roger's on mute.

DR. CLEMENS: Here we go. Yea.

DR. RIMM: Yes. He's back, yes.

DR. CLEMENS: Hey, hey.

DR. RIMM: You know the answer, Roger?

DR. CLEMENS: Yes. Actually, Tom is right on the money with that, and actually there's a delayed metabolism in the pregnant, lactating women when it comes to caffeine. It doesn't clear nearly as well and the solubility is one of those characteristics. Clearly, the methylxanthines are much more

involved. Same with caffeine, any of the theobromine and theophylline, which of course you find in tea and hot chocolate. They're metabolized in the same metabolic pathways.

DR. RIMM: I mean, I guess obviously we're talking about the alcohol chapter, but I don't know if anybody else was going to touch on that. But I guess that could be an issue.

DR. CLEMENS: The entire composition of breast milk and components that are passed through, even to the point, Eric, when it comes to various peptides that we ingest or digest protein to create peptides that pass through breast milk, and what are the implications of those peptides on infant milk? Clearly a topic for another day.

DR. RIMM: This alcohol chapter sounds like it's getting larger as we speak. No. Right. I guess --

DR. CLEMENS: I don't think it'll fit there.

DR. RIMM: Yes. No, it won't fit there. I don't know if it's something that Rafael will touch on, or anyone else, but it may be something that does not get captured within this guideline.

DR. VAN HORN: Right.

DR. CLEMENS: But to that point, it may well be in the future that we go below two years of age and that topic could be covered.

DR. RIMM: Yes, right. Good point.

DR. VAN HORN: I was just going to echo that, Roger. Thank you for bringing that up. One of the things that has been an issue with Committee, and we have mentioned it many times, is that fortunately the data have been accumulating and emerging related to even in utero what consequences or impact diet may have in fetal development, as well as, you know, the first two years of life. And the fact that as these Dietary Guidelines

continue, it will become really necessary to pay attention to the whole concept of eating, even at birth or earlier.

And so, questions related to breast milk and quality of breast milk really do deserve to have time. I think that just this alcohol question alone will be incredibly valued by people, because I know among many lactating moms, you know, this kind of a question would be high on their list in terms of whether or not they should even try to, you know, have a glass of wine or something.

So, I think this is very valuable, but the points you're raising about other beverages and other side effects of things that maybe people don't even think about such as caffeine or hot chocolate, you know, definitely should be on the list for future consideration.

DR. CLEMENS: You raise an excellent point, Linda. I think a guideline or a recommendation for the subject Committees

to actually start to look at the epigenetics and the nutrigenomics impact of feeding babies in utero, as well as the first two years of life and the impact of genetic expression. And you could use an example, and this could be one of those examples.

DR. VAN HORN: Yes, excellent point.

All right. Other comments from anyone on the Committee? Or, Eric, anything else you'd like to add?

(No audible response.)

DR. VAN HORN: We really appreciate your willingness to go early like this.

And I think at this point then, we'll take a lunch break, but we'll try to keep it short and reconvene at 1:40. That's Eastern Time at 1:40. And then we'll launch into the sodium, potassium, water chapter.

With that, thank you and we'll be back at 1:40.

(Whereupon, the hearing was recessed at

12:55 p.m. to reconvene at 1:40 p.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

1:42 p.m.

DR. VAN HORN: Welcome back, everyone. We are now ready to begin the sodium, potassium and water subcommittee report, and that is chaired by Larry Appel.

Larry?

DR. APPEL: Great. All right. Well, let first acknowledge the Committee members and staff working on this component of the report. So, besides myself, Tom Pearson, Linda Van Horn, Chris Williams, and our staff, Donna Blum-Kemelor and Patricia Guenther, Joan Lyon and Holly McPeak.

So, next slide. So, these are the topics that actually have and will be covered.

So, we already covered sodium intake and blood pressure in children and adults at the November meeting. Today we're going to cover some issues that are revealed in the sodium modeling. Then the second

content area is potassium intake and blood pressure, and we'll cover that today. That wasn't covered previously. And we'll also cover potassium modeling. In terms of water intake and health, we're not going to cover that, but like sodium and potassium, will present our conclusions and implications.

We'll discuss an issue that's important to our Committee, but also I think relevant to others, which is the adjustment of sodium and potassium recommendations by energy intake, and then public comments and research recommendations.

So, the objectives of the sodium modeling were to document the relationship of sodium with energy intake and to describe sodium levels under several different scenarios. One is a base condition, which is what we've seen previously. This is the base USDA dietary patterns. And then a typical, which is to give an -- this would be if people choose badly and they consume foods that are

higher in sodium intake, if more typical choices were made, if people weren't selecting better foods. And then a lowest, which is at the other end. You know, what if people really, you know, went out of their way and selected only the lowest available sodium food in a category.

And I guess to preface that, it's first important to look at where we are. And I think Shelly covered this format a little bit different from her graphs, but I think the same point. And then that is that average in this case means dietary sodium intake across the population for men and for women really exceeds the 2,300, which is the recommended upper limit for the general population of adults, and then 1,500, which is the recommendation for those who are especially vulnerable to the adverse effects of salt on blood pressure.

So, let's move onto the next slide. One slide back without the black line,

please.

Okay. So, this figure, or this line actually, presents the average sodium intake plotted by energy intake or calorie level. And this is real data. It's from NHANES. And I think if you go down to the bottom, there's a really important number that is actually quite striking, which is the correlation of sodium and energy intake, which is .8. I mean, it's amazing how tight sodium is with calorie intake. It also presents a lot of methodological issues when you're looking at cohort studies where people estimate sodium intake and you have problems with accurate collection.

Next slide. Okay. Now, this line actually is not real data. These are targets in the DASH sodium trial where we were trying to provide the recommended intake of sodium, which is the upper limit 2,300 at 2000 kcals. And those Xs actually correspond to what the targets were in those trials. So, if somebody

was 1,600 calories, their target was actually a little bit below 2,000 milligrams. And then if they required 3,600 calories because they're very physically active, they were fed food that had provided around 3,600 milligrams.

Next slide. And this is a similar line, but it's for the lower level of sodium intake that was offered in the trials. So, in this case it was around 1,500 milligrams of sodium at 2,000. So, you see the same sort of dose response, but again, these are targets in a major trial.

Next slide. This is actually also targets, but this was based on USDA Food Patterns. And this is choosing nutrient-dense foods prepared without salt and using, I think, decent choices, but they could be better as we'll show. But you again see this direct relationship of sodium with calories.

Now, if individuals select badly, but fall within the category structure, they

still will have this marked, you know, calorie/sodium intake relationship. This is again with more typical salt content of foods as opposed to ideal.

Next slide. And at the other extreme, if people really sought out the lowest available sodium product, and this is eliminating all salts in preparation and using the lowest sodium foods instead of the inherently high- sodium foods. And you can come close to what is the recommendation for people in those high-risk groups, roughly 1,500 milligrams at 2,000 kcals.

So, next slide. So, the main sort of points of this is that the base USDA Food Patterns is actually about 40 percent less than current intakes, and this is roughly similar to what is provided in this major trial, the DASH sodium trial, the intermediate level which corresponds to 2,300 milligrams at 2,000. Unfortunately, if you just made bad choices, your sodium intake would be much

higher. And then the last bullet, which is quite important, which is with really careful selection you can get much lower, but it's pretty rough, and this is a level that's about 70 percent below the current intake levels.

So, I don't know if we want to stop here for questions. I think it leads naturally into the next section. Maybe we could just stop after we finish the sodium section and take questions at that point.

So, our first question is what is the effect of sodium intake on blood pressure in children and adults?

So, now I'm just going to -- next slide -- just review the draft conclusion and draft implications. And as we said, we presented the data in November.

So, the draft conclusion. A persuasive body of evidence has documented that in adults as sodium intake decreases, so does blood pressure, and that's an evidence Grade I. A large body of evidence has also

documented a similar relationship in children birth to 18 years. Let's go back to that slide, please. And we made that an evidence Grade II. There's some debate about -- and I think many groups are sort of struggling with this. You know, it's not as strong as the evidence in adults, but it's also not bad. There's meta- analysis and also at least one, you know, major trial that's documented it. So, we made that an evidence Grade II.

Next slide. So, there are a lot of implications here, so it's worthwhile to sort of review each one.

So, implications. A daily sodium intake of less than 2,300 milligrams is recommended for the general adult population and an intake of 1,500 milligrams for hypertensive individuals, blacks and middle-aged and older-aged adults.

Second bullet. Because together the latter groups comprise nearly 70 percent of U.S. adults, the goal should be 1,500

milligrams per day in the general population.

Third bullet. The current U.S. marketplace make this a challenging but compelling public health goal to be achieved over time. You know, there's been some discussion about whether to actually put some time frame in this, by a certain date, and maybe we should open that up for discussion, make sure that point is at least covered.

And then the fourth bullet, all individuals should concurrently increase their consumption of potassium because a diet rich in potassium attenuates the effects of sodium on blood pressure.

Next slide. The projected health benefits of reduced sodium intake are substantial and include fewer strokes, cardiovascular disease and death, as well as substantially reduce health care costs. And we provide documentation of that in the chapter.

And then next bullet. In view of

these potential benefits and the currently high intake of sodium in the general population, children and adults should reduce their sodium intake as much as possible by: (a) consuming less processed foods, which are high in sodium; and (b) preparing foods with little or no salt. Of course, we have the same issue as others with the definition of "processed."

Next slide. An emerging concern is the addition of sodium to products such as poultry, pork and fish in the form of injections, marination or surface sprays. Although such processing seems commonplace, quantification of the sodium content is scant and evidently not regulated.

And then the third bullet, because sodium intake is tightly linked to calorie intake, reducing calorie intake should also lower sodium intake.

Next slide. So, we view the -- you know, I guess per the call last week, some

sort of identifying impact issues. I think the first one is the sodium goal for adults, and for the reasons that we just discussed, the goal should be incrementally reduced from 2,300 to 1,500 milligrams over time, but preferably no later than blank. And then secondly, a sodium goal for children. Because early stages of blood pressure-related atherosclerotic disease begin during childhood, children should likewise consume diets that are reduced in sodium intake.

And I think there's one more slide before we'll stop, the research recommendations.

So, first is conduct studies including clinical trials in children to determine the effects of sodium on blood pressure and the age-related rise in blood pressure. I actually probably would modify that by adding "sodium and other dietary factors," but I know this chapter is just on sodium.

Then the second is to conduct trials that determine the effect of sodium reduction on clinically-relevant non-blood pressure variables such as left ventricular mass, proteinuria and bone mineral density.

So, I think that that is the end of the sodium section of the presentation, so maybe I should just stop here and take questions and hear comments from the Committee.

DR. CLEMENS: This is Rog. Can you hear me all right?

DR. APPEL: Yes, I hear you fine despite your being in California.

DR. CLEMENS: Well, I thought maybe being a long away from everybody else, I may have lost signal.

Thank you for the very stimulating presentation. You always do a great job.

I just want to bring to everyone's attention your remark on slide 17 on the implications. That's quite an issue, frankly,

as you know. Two things. One, that poultry and other products are actually used -- by mandate, by the law, have to actually brine some types of products. So, in addition, things like cheese have brining. Olives; many people enjoy the Mediterranean diet, are brined to preserve. And also pickles. So, a lot of those products are required by law to go through the brining process. And that differs of course whether a product is fresh or if a product is frozen, and that goes to the poultry-type products like the turkeys that you mentioned.

DR. APPEL: Yes.

DR. CLEMENS: So, there are some regulatory issues they maintain so that product remains safe, and that is stipulated by the USDA.

DR. APPEL: So, yea, I hear what you say. I think that there are certain products where I think it is intrinsically part of, you know, the preparation. And

certainly there might be some limits, but there's also perhaps some excess, and I don't know if we can deal with it. I don't think we can deal with it on a product-by-product.

But I think the group that I was thinking about were more sort of like pork which now seems to be it's the rule, not the exception that it's injected with brine, and I don't think there's a regulatory requirement for that. A lot of the prepared poultry items that are provided like pre-cooked chickens, rotisserie chickens that you get in supermarkets, those are now injected. And even I think some of the uncooked poultry products are now injected and fairly high as well. You know, turkeys come to mind.

But the thing about this whole area is that it's not really -- some of them are -- there is reporting, and others aren't. And I think it has to do often where the site of the injection, so like if it's done in the supermarket, which it might not get reported

on the label. And then other places if it's done beforehand, like pork, it probably is on the label. What's done with fish, I don't really know if there's reporting.

But it's very haphazard and I really sense this is an emerging area that should be I think of concern to manufacturers in particular because there are groups like those that are producing baked goods and cereals that I think many of which are -- companies are making really aggressive efforts to reduce their sodium. And meanwhile, there are other groups that are just sort of adding sodium and doing it, you know, under the radar screen, so to speak.

DR. CLEMENS: Well, I can appreciate under the radar screen, as you mentioned, and I just wanted to be sure that we all realize that depending on the process and the product and how it goes through the food chain or food distribution, there are regulatory guidelines and those guidelines are

stipulated by the USDA. Those guidelines are intended to provide a safer food product.

DR. APPEL: Yes.

DR. SLAVIN: But also; this is Joanne, if it's on the label, no matter how the sodium got there, they need to make sure that that's the right amount as consumed.

DR. CLEMENS: Absolutely. I agree with that, Joanne. Good point.

DR. SLAVIN: Depending on when they put it in, it doesn't really matter on the label, it's got to be as consumed. So, if anybody comes to them and argues, they got to make sure they meet that guideline.

DR. APPEL: I'd appreciate some staff assistance on this one, because my understanding though is that many of these products where the injection occurs in the supermarket, it's not included on the label, the sodium content.

DR. POST: Roger and Larry and the rest, this is Bob Post. I have a comment

about that. There is a requirement that anything added to products, you know, any product with two or more ingredients of course has to reflect in the ingredient statement. And there's also a requirement that where solutions are added to meat and poultry products that it be reflected as part of the product name. In fact, there are policies in place, and I guess this was some of Roger's comment, too.

Now, if that's not happening, then that's a problem. But there are controls in place to ensure that consumers receive not only a complete ingredients statement, but a product name reflecting a percent of added ingredients, as well as the nutrition facts which of course would have the sodium declared. That's the intent.

DR. CLEMENS: That's my experience, too, Rob. Thank you very much for that very important comment.

So, what you're saying, Larry,

maybe we have to look for alternatives to be sure that the food supply is safe and other methods to make cheese?

DR. APPEL: Yes. To me, I guess the implication is to understand where new sources of sodium are and to quantify the amount, because I don't think that many people have traditionally thought of like turkey a source of sodium. And now with certain of these products you're getting 300 or 400 milligrams per serving as opposed to very little. And the same thing with pork, which is inherently a low-sodium product.

DR. CLEMENS: Indeed, pork is inherently, as is turkey, as most is most poultries are.

DR. APPEL: Yes.

DR. CLEMENS: At that point. And so, it depends on how it goes through the food distribution and what's mandated by law by the USDA. And as well all know that sodium injections are required for pork and for

bacon. We may not advocate bacon consumption, yet that's the reality of how it's produced because it's a safety issue.

DR. APPEL: Yes.

DR. CLEMENS: So, maybe it's incumbent, Larry, for us to look for alternatives that would actually provide a safer food supply. And to my knowledge, because I'm the food scientist on this Committee, I'm not aware of any good low-cost food safety interventions other than sodium chloride in this regard.

DR. APPEL: Yes, you know, I think there might not be as much wiggle room like with bacon, although I can't say for sure. It's interesting though for like cold cuts, and I think that there are reduced versions of let's say, you know, turkey breast that you can by from the deli now. So, clearly there's some wiggle room with that particular product, but there might not be with others.

DR. FUKAGAWA: This is Naomi. But

it could also work that we just need some consumer education, because at least, you know, when you brined a long time ago, you knew to soak your brined meat in order to remove some of that sodium, or to rinse things.

DR. APPEL: Yes.

DR. FUKAGAWA: So, that might be another side of things if it's from a food safety standpoint necessary.

DR. CLEMENS: That's an excellent comment, Naomi. And if you recall, this last couple of years brining by consumers has become quite popular.

DR. FUKAGAWA: Right.

DR. CLEMENS: In addition, it's become quite popular on the Food Network, and they're advocating that you brine certain kinds of foods. And to Larry's comment, people may not be aware that brining actually contributes to the sodium content of these kinds of foods.

DR. FUKAGAWA: Right.

DR. APPEL: Okay. All right. Well, we can go back. Is there any other comment on sodium before I move onto potassium?

(No audible response.)

DR. APPEL: Okay. So, we had three areas. The second one was potassium. This wasn't covered, so I'm going to provide some detail about potassium.

So, the next slide. So, the second question, what is the effect of potassium intake on blood pressure in adults?

Next slide. So, we actually conducted searches on blood pressure. There was no date range. We really did focus mostly on randomized control trials. This is an area where there have been a lot of trials, but mostly with actually supplements, some with food. But if they do use food, then it's potentially confounded with other nutrients like fiber and other foods or nutrients.

Inclusion criteria of adults, greater than 10 subjects per arm. And we did exclude chronic disease. And the main outcome was blood pressure or hypertension status.

Next slide. So, there actually were, you know, several systematic reviews, actually three meta-analyses as well. So, the DRI report concluded that there was an inverse effect on blood pressure. The higher the potassium intake, the lower the blood pressure. There was a report by Burgess, and it was a combination of epi studies, randomized trials and it did not reach the conclusion that there was a protective effect. On the other hand, there were three -- that was not a meta-analysis. They didn't have to really combine the data. There was an early meta-analysis by Cappucio/MacGregor. And then Geleijnse and Whelton. The Whelton analysis is particular good because it gives the delta of blood pressure per delta of potassium.

And the meta-analyses reached the

conclusion that as potassium intake goes up, blood pressure goes down. I will give a caveat that there are really not dose-response studies, so these are typically two-dose studies. They're just one level of intake and then a second, and in contrast to the sodium where there are actually several dose-response trials.

Then there was a systematic review, Dickinson, that did not see an effect of potassium on blood pressure, but it was really an extremely restrictive enrollment criteria that weren't really -- we wouldn't really apply the required fairly long treatment periods, which are actually difficult to sustain on free-living people as well as just hypertensive subjects.

So, the next slide. Then there were new randomized controlled trials. And these were -- you know, they're sort of a hodgepodge here because, to tell you the truth, the field has moved beyond does

potassium lower blood pressure, and it's down to sort of what I call ancillary issues. Does potassium citrate versus potassium chloride have any different effect on blood pressure? So, those are the types of studies that were done. And so, it's hard actually combining these and I really don't think they contribute that much to the overall answering the question.

Next slide. So, our draft conclusion. And we're hedging a bit in part because I really wanted to hear how people were phrasing their conclusions and also get a sense of the evidence grade. And so, this is what we crafted prior to this webinar. And that is, that a considerable body of evidence that documents that a higher intake of potassium is associated with lower blood pressure in adults.

And we're fluttering between an evidence Grade I or II. You know, when I look at the data for sodium in children, I don't

think it's as strong as the sodium data in adults, but I think it's better than the sodium grade in children. So, ideally I would give it a 1.5, but we can't split hairs, no significant digits to the right of the decimal point. So, I'm inclined after hearing a lot of discussion to actually give it a Grade I, but I'm open to discussion on this one and other issues.

So, I think we have one or two more. Actually, we have the implications and some research recommendations.

So, implications. Diets rich in potassium can lower blood pressure.

Second bullet, a high intake of potassium also attenuates the adverse effects of sodium on blood pressure.

Three, other possible benefits include a reduced risk of developing kidney stones and decreased bone loss. You know, these are actually -- they were covered in 2005, also in the DRI report, but there was

really no new evidence, so I didn't present the data either in November. But these are possible benefits.

Next slide. In view of the health benefits, potassium and its relatively low intake by the general population, increased dietary intake of potassium is warranted.

The next bullet. The IOM set the AI for adults at 4,700 milligrams per day. Only six percent of men and fewer than three percent of women meet or exceeded this amount.

Number three. The IOM set the AI for potassium in children as well, and yet less than three percent of children have met that AI.

And then the fourth bullet. Available evidence suggests that Blacks and hypertensive individuals especially benefit from an increased intake of potassium.

Next slide. So, similar to sodium, we also conducted some potassium modeling. The issues were a little bit

different here, some similar some different. First one, what is the relationship of potassium and energy intakes in the U.S.? And secondly, how would potassium levels of the USDA Food Patterns change if an assumed amount of coffee and tea based on current intake levels were to be added? This was not done in 2005, and I think Patricia pointed out that we're missing, not a huge, but a real source of potassium that is under-appreciated.

So, next slide. This is similar to the earlier slide for sodium. Displays mean dietary potassium intakes in NHANES in 2005 to '6, and shows it both for men and women. As you'll see soon, it really does reflect that most likely the calories consumed with obviously more being consumed in general by men than women.

So, next slide. So, this is little bit more ragged than the one for sodium, but generally as energy increases, so does potassium. Here the correlation is .72,

still pretty high. Just to refresh your memory, it was .8 for sodium and energy.

Next slide. This is actually what was provided in the DASH trials. And again, these are not actual intakes. This is the targets. And you can see it's a line. It's about 4,600 milligrams at 2,100 kcals.

Next slide. This is the amounts in the base USDA Food Patterns. And again, you see the same pattern of increased potassium intake with increasing energy. One important point is that it's a bit less than what we studied in DASH. And I can tell you that we purposely increased the amount or had high levels of potassium in the DASH side because the DASH study was originally designed as a study of dietary patterns to lower blood pressure. And we felt that potassium was one of the key players here, and we wanted to have it high. We actually thought that the amount that we provided was about at the 25th percentile of intake. I think we probably

were wrong. It was closer to the fifth or tenth percentile. But in any case, that's what we did provide.

Next slide. So, this is the amount that would be consumed if you add coffee and tea for adults at the average levels of fluid consumption. So, you can see that if individuals consume on average 18 ounces per day, they'll get 247 milligrams per day of potassium. So, in addition to staying awake, you get more potassium. So, everybody should consume more potassium more coffee, which I'm going to do shortly after this presentation.

So, summary of the potassium modeling. So, the potassium is provided in the base food patterns ranges from roughly 1.5 to 1.9 milligrams of potassium per kcal. Very tightly, you know, correlated with calories, again .7. This potassium density is actually higher than current intakes, but lower than what we provided in DASH, which is around 1.9

to 2.5 milligrams per kcal. And it would be somewhat higher, five to eight percent if typical amounts of coffee and tea were consumed by adults.

Next slide. Okay. Actually, maybe I should just stop here. This is the issue about energy. Yes, let's just stop here for the potassium section and have some discussion. Unless -- I'm just seeing. The potassium research questions which -- maybe if you could go to that slide, Holly, the potassium research questions. Okay. Right here.

So, the first one is to conduct trials to test whether increased potassium intake or potassium-rich foods increased bone mineral density. I think this is an incredibly important issue, but it hasn't been addressed. We recommended it in 2005 and there's only sort of slow progress at the NIH for doing such a trial, but I think it has tremendous public health importance.

And the second one, conduct dose response trials that test the main and interactive effects of sodium and potassium on blood pressure and other clinically relevant outcomes. And that probably needs to get -- I think Tom pointed this out. There are some nuances to this. I think one of the areas about potassium that has been -- it only can be addressed indirectly. Is it a low intake of potassium that is a risk factor for elevated blood pressure? In converse, do you get more bang for your buck increasing your potassium level even above what's recommended? And I think probably both are true, but we don't really have good dose response studies, as I said.

And the second one, the interactive effects of sodium and potassium have been dealt with in a few trials, but I think more would be useful, particularly if it involved multiple levels of potassium.

So, I think I'll finish there and

then go back to the energy adjustment, which I think is an overarching issue.

Shall we discuss potassium right now?

DR. FUKAGAWA: This is Naomi. Does the type of tea make a difference with respect to potassium content?

DR. APPEL: Yes, I don't know. That's a good question. You mean green tea versus other forms of tea?

DR. FUKAGAWA: Black versus --

DR. APPEL: Yes.

DR. PEARSON: I wouldn't imagine it would, because it's inorganic. The roasting and fermenting I don't think changes anything. It might change the bulk.

DR. FUKAGAWA: But it may differ with respect to the plant source, right? You know, because there are people -- like is chamomile as potent as --

DR. PEARSON: Oh, I thought even though the -- I mean, I'm talking about tea

bushes as being the same plant.

DR. FUKAGAWA: Right. Oh okay, tea tea.

DR. PEARSON: Tea tea, yes.

DR. FUKAGAWA: Rather than what generally is looked upon as a beverage that, you know, now there's all kinds of teas.

DR. PEARSON: Because as a plant source, they should be relatively high in potassium as one of their mineral sources.

DR. CLEMENS: Tom is right. This is Rog. Tom is right about the mineral content of these teas. However it's handled and through fermentation and how it's dried could have somewhat of an impact on the mineral content such as potassium.

DR. PEARSON: Right.

DR. CLEMENS: And we would all expect that.

DR. PEARSON: Yes.

DR. APPEL: Anything else about potassium?

(No audible response.)

DR. APPEL: Then let me go back to the slide on energy adjustment, just because I want to make sure everybody, you know, is aware of the issues.

So, energy adjustment. So, it's a bit of a haphazard -- I don't want to call it haphazard; there is some science, but energy adjustment DRIs. It's done for sodium in children and older adults, and it's done for potassium in children, but there's really an inconsistent application to other nutrients such as proteins and fiber. I think maybe for fiber it might be indexed to calories, but as I said, it's only done partially for sodium and potassium.

And yet, the reality is that both, in sort of just, you know, regular eating environments, you know, when people are eating together as a family, whether you have 1,500 calories or you're running marathons and consuming 4,000 calories, people are consuming

typically the same food at the table. So, there's really energy adjustment that occurs implicitly. And then, in the studies that we do, typically feeding studies that involve food, there's an energy adjustment. You provide more of a nutrient depending on, you know, the calories an individual consume. So, energy adjustment occurs. And you might have considered it, you know, sort of like it's just math, because the more you eat, the more you're going to get. And that's the case for sodium and potassium with these really high correlations. And yet we have, you know, absolute levels for guidelines.

And so, we had a lot of discussion about this, and we had a panel of experts join us for a conference call in January of this year. And the sense was not to make any formal recommendation about energy adjustment as a recommendation, acknowledge this as a very practical issue and then use this in the modeling that Trish and others are doing.

And, you know, I think that in the next round of Dietary Guidelines they really need to spend more time on this issue, because there's a combination of science and practical reality that needs to be dealt with, and sodium in particular is one area where this has both implications, science and practicality.

So, I don't know if other people have comments or thoughts on it. It's really not an issue that sort of like you about up front, but it's really quite important, because it's a primary determinant of how much of these electrolytes we consume.

DR. VAN HORN: Comments from the Committee? Christine do you want to say anything about children?

(No audible response.)

DR. VAN HORN: I don't know if she's still there.

DR. PEARSON: This is Tom. Obviously, this is the same issue with cholesterol and milligrams per day.

DR. APPEL: Yes.

DR. PEARSON: And, you know, men are almost twice that of women in cholesterol consumption. That's because of the caloric intake. So, it probably hits us quick with sodium, but it's an omnibus issue.

DR. APPEL: Yes. See, and I think that the DRI Committees didn't spend a huge amount of time on this. They probably were focusing mostly on whether it should be increased or decreased, and then the issue of calorie adjustment is often an 11th hour issue.

DR. WILLIAMS: This is Christine. I think it certainly helps with children to have everything calorie-linked, because the caloric intakes are so different at different ages. But I think it would be just as helpful to have it linked to calories with adults. To recommend one level for everyone just doesn't seem appropriate, and we've always had that problem with cholesterol recommendations also.

And we do now have fiber intake linked to calorie intake, which is very helpful.

DR. SLAVIN: But I think --

DR. APPEL: See, this is where --

DR. SLAVIN - creates problems, you know, with fiber because of with labeling, you know? So, I think it works for the DRIs, but it typically is difficult to translate into recommendations.

DR. APPEL: See, the thing that is difficult here is that from a science perspective if you need -- let's say you need only, you know, 10 millimoles of sodium just to replace your intake, a very tiny amount, you know? And that's true whether you're 2,000 or 4,000, you know, maybe if you would adjust that from 10 to maybe 20. But it's so far below what we are currently consuming that it's almost, you know, from a health perspective, the amount of sodium just gets magnified so that, you know, if you're a triathlete and consuming 5,000 calories per

day, the amount of cholesterol, the amount of sodium, the amount of all of these sort of nutrients is really huge. And it's indexed by calorie, but is it really healthful to be consuming let's say, you know, 300 milligrams of sodium even if that corresponds to a low intake?

DR. VAN HORN: This may be one of those again areas where, you know, we make our statements regarding the evidence and, you know, I don't think anyone would argue the benefits of reducing sodium nationally in the food supply, et cetera. But the actual steps towards that and how it gets achieved over what period of time, et cetera, et cetera, you know, that's clearly going to require some further discussion and negotiation, and probably beyond the scope of this Committee.

DR. APPEL: Just as a plug here, the Institute of Medicine report is going to be coming out next Wednesday. So, that will deal with a lot of the translational issues.

And, I mean, we probably, you know, at that point can, you know, pull sections of that report into our report dealing with some of the general rather than specific translational issues.

Okay. Then I think we move onto water, don't we?

Okay. So, what amount of water is recommended for health? We prepared a draft conclusion and this is one where the type of evidence is very different from the evidence that we have for other studies, randomized trials, cohort studies. So, the draft conclusion is, as I said, a bit different. Based on an extensive review of evidence, an IOM panel in 2004 concluded that the combination of thirst and usual drinking behavior, especially the consumption of fluids with meals, is sufficient to maintain normal hydration. However, because water needs vary considerably and because there is not evidence of dehydration in the general population, a

minimum intake of water cannot be set. All right?

And we decided not to apply an evidence grade to this body of evidence in part because, as we state in that second sentence, there's no evidence of dehydration in the general population. If you look at serum osmolalities by decile of water intake, it's flat. You don't see any evidence of dehydration. And in terms of chronic disease, we reviewed the literature in 2003, 2004 for the DRI report, and also did literature searches for studies since that report was published, and really there's not much out there. So, that might be a point of discussion, but let's move onto the implications.

So, first, in order to prevent dehydration, water must be consumed daily. Secondly, healthy individuals who have routine access to fluids and who are not exposed to heat stress consume adequate water to meet

their needs. Third, purposeful drinking is warranted for individuals who are exposed to heat stress or who perform sustained vigorous activity. Fourth, in view of the ongoing obesity epidemic, individuals are encouraged to drink water and other fluids with few or no calories.

So, research recommendations. Investigate the role of increased total fluid intake as a means to chronic disease. I think there's a reasonable basis for conducting further epidemiologic studies for the most trial, not trials, of water consumption on illnesses such as bladder cancer, kidney stones. There's a little bit of a signal for heart disease, but it's only one study. So, we kept it broad because the data at this point is not very voluminous for any one condition.

I think that's -- we could look at this -- go back a slide. So, maybe we could just talk about water and our approach,

particularly the fact that we don't provide an evidence grade, which I sense we're not going to be the only ones. I believe, Shelly, your group didn't have evidence grades for some your conclusions. So, you know, maybe that's okay. But I'm interested in hearing what other people think.

DR. NELSON: This is Mim. But isn't there evidence that we don't have a dehydration problem? You know, like --

DR. APPEL: There is evidence. Yes, there is.

DR. NELSON: Yes.

DR. APPEL: But it's a funny kind of evidence. It doesn't fit any of our traditional categories. You take NHANES data, and this was done for the DRI report, and you classify people by decile of fluid intake. So, some people are consuming like less than a liter, you know, half a liter. And then you look at people that are consuming four of five liters or more. And their serum osmolality is

flat.

DR. NELSON: Yes.

DR. APPEL: You know, it's the same. It's like, you know, 280-290, whatever it is.

DR. NELSON: Right.

DR. APPEL: It's just flat. Within age group and gender there are some modest differences. So, that's the kind of evidence, so it's not a clinical trial. It's not a cohort study. And so, I mean, you could give it a evidence Grade I for there is no evidence of dehydration in the general population.

Now, that would be an interesting possibility. I mean, if you want to sort of revise the rules on evidence grades and then put just that very narrow statement, there is no evidence of dehydration in the general population, and then you move everything else to implications. That could be an

alternative.

DR. NELSON: It probably doesn't matter. I mean, I think your conclusion and your implication, you know, are sound. So, it probably doesn't even matter that much.

DR. APPEL: Yes, where sort of like this is sort of marginal technical things that aren't going to have an impact.

DR. NELSON: Right. Clearly, we don't need to be pumping water unless it's hot or you're out for long exercise periods.

DR. APPEL: Yes.

DR. SLAVIN: Yes, I think it's fine without the grades. I think it's good. Because you're right, the data is not going to fit well within the usual grading.

DR. APPEL: Use the framework for all of our decision making to this point.

DR. CLEMENT: This is Roger. Do you wish to make a comment on hyperhydration? And I appreciate your remark that you've not seen any changes in plasma osmolality or any

evidence of hyponatremia, yet clearly there are cases out there where too much water consumption leads to intoxication, hyponatremia and obviously has some significant health implications.

DR. APPEL: You know, that's a good point, Roger. There are some selected circumstances and typically -- but it's in a setting for not a general population though. So, the ones that come to mind, and they are fortunately infrequent, but they do happen, are in the setting of poorly trained athletes or athletes who take long periods of time to complete endurance events and they develop hyponatremia from over-consumption of water. So, that's one group. And then the second group are individuals, you know, who force volume consumption like, you know, fraternity hazing where that occurs. And then the third group actually is psychogenic polydipsia, and that's individuals who develop hyponatremia.

But, you know, those are obscure,

and so I'm not quite sure that at least for the last two we would mention it. But for endurance athletes, you know, I think there's both concern for under and over-hydration. And I'm not quite sure if we should get into that area. I don't know. I'd be interested in hearing what other people think. Many people think that we've over-emphasized the concerns about over hydration and under-emphasized the concerns about dehydration in athletes. But it's an area that we didn't -- I don't know, I feel a bit uncomfortable, because I think is really more for the general population that isn't doing these endurance events -- again. But, you know, what do other people think about this?

DR. CLEMENS: I was just thinking maybe a paragraph or a couple of sentences might be warranted to address it.

Miriam, you -

DR. APPEL: We actually do with -- -- I'm sorry to interrupt. We do actually

have it in the chapter after we mention these as issues, but we don't -- I think I tried, at least for the implications, to draw the statements that would be most relevant for the general population.

DR. NELSON: I think just a couple of sentences in the chapter is just fine. Because, it is an issue, but I don't think it needs to be here.

DR. CLEMENS: Thank you. Thank you so much, Miriam.

DR. SLAVIN: I'm wondering; this is Joanne, about just kind of the misconception that people are going to lose weight by drinking water. There's seems to be people that over- hydrate and somehow think that's going to help them. Maybe it's an alternative. You know, it's like other habits. And I don't think there's any data on that, right?

DR. APPEL: Yes, I mean, I didn't go into this set of questions for which there

was no data, but that was one of them, what is the impact of water intake on weight? And I don't remember the specific results of that search, but I do remember that we came up pretty dry, you know, maybe one or two studies that were nothing to hang your hat on. You know, I'm not sure if we actually state anything in the chapter per se.

Just, Holly, if you'd take a note of that, maybe I can return to that --

DR. SLAVIN: Yes, if you guys --

DR. APPEL: -- when we headed it up.

DR. SLAVIN: -- the fact that you searched and that you've, you know, found nothing would be actually useful. But make sure that's documented.

DR. APPEL: Yes. Yes, it's an important point, because it actually came up in 2005, the Committee deliberated. I remember that was one of the questions that Committee members were interested in, the

relationship between water consumption and weight. And I know that for the 2003 DRI we didn't find anything and with this subsequent search the same issue the same result, no data.

DR. SLAVIN: So, maybe it is worth saying something so we don't have a sort of publication bias.

DR. APPEL: Yes. Inadvertently, yes.

DR. SLAVIN: Yes.

DR. APPEL: Okay. So then, well, I don't know. The other groups really didn't do this, but we do read our public comments and there have been several comments related to sodium, some dealing with sort of the approach, so the voluntary gradual approach, step-wise change, and then acknowledging I guess the fourth sub- bullet that Roger mentioned, or technical and regulatory barriers as well that have to be addressed. Safety issues for certain products. And other

roles.

So, you know, to some extent I think this is actually an area where the IOM report will have more to say because they actually had involved experts who dealt with safety matters, as well as other issues like taste and its role beyond taste, too.

Next slide. So, then there was a recommendation related to sodium and potassium. That's actually something our Committee talked about, too. And it's a bit tricky in part because it's almost like a discretionary calorie-kind of thing where you want to make recommendations to the general population on intake of a nutrient, and ratios is a very challenging type of concept to get across, as well as interactions. So, and then at the bottom, focus on hydration.

But again, I think, you know, we are pretty sound advice, you know, because we don't really see a problem with dehydration in the general population and even in athletes.

too.

Okay. I think that's about it with our section. We have the chapter finished. There's still, you know, editing to be done, but I think we're in pretty good shape.

DR. VAN HORN: I would agree. Thank you, Larry. That was excellent.

All right. Well, I think then we're ready to move on, and our next presentation will be then from Roger in regard to Food Safety and Technology.

Roger?

(No audible response.)

DR. VAN HORN: Uh-oh, we don't hear you, Roger.

DR. CLEMENS: I had to push the un-mute button.

DR. VAN HORN: That's a good start. Okay.

DR. CLEMENS: Thank you so much. Rafael and Naomi are a part of the team right

here, and I extend my great appreciation on behalf of Rafael and Naomi, of course, to Kellie, Donna, Holly and Shirley, without whom none of this would actually be possible.

To kickoff here, will be my friend and colleague Rafael.

So, Rafael, why don't you talk to us about the in-home issues and fish. Thank you so much. Rafael?

DR. PEREZ-ESCAMILLA: Yes. Next slide, please. Keep on going. Keep on going. Thank you.

The overarching question that I will be addressing today is what behaviors are most likely to prevent food safety problems and to what extend do U.S. consumers follow these behaviors.

For this presentation the sub-questions are organized following the principles of FightBAC!®; clean, separate, cook and chill. Studies were included if they were published in the peer reviewed literature

between 2000 and 2009, included individuals two years and older, and we were interested in the population at large, as well as specific vulnerable subgroups that may be at higher risk for foodborne illness due to their compromised immunological status. The NEL review also benefitted from secondary data analysis of the 2006 USDA FDA CSFAN survey, which stands for Consumer Food Safety and Nutrition Survey.

Next slide, please. Next slide.

DR. O'CONNELL: Rafael, just one second. The slide got stuck.

DR. PEREZ-ESCAMILLA: Okay. The first set of sub-questions deals with what techniques for hand sanitation are associated with favorable food safety outcomes and to what extent do consumers follow them. The proposed conclusion regarding this is best practices for hand sanitation, is that clear and consistent evidence shows that hand washing with plain soap for 20 to 30 seconds

followed by proper hand drying is an effective hand hygiene technique for preventing cross-contamination during food preparation, and it is Grade I. Alcohol-based, rinse-free hand sanitizers are an adequate alternative when proper hand washing with plain soap is not possible.

The implications of these findings are that antimicrobial soaps are not needed for proper hand hygiene at home and should be avoided due to possible microbial resistance to antibacterials associated with their long-term use.

The evidence for this conclusion is robust as it is based on 17 studies, four meta- analysis or systematic reviews, six randomized controlled trials, four of which are summarized in these slides and two in the following slide, five quasi-experimental studies and two observational prospective studies.

With regards to hand sanitation

behaviors consistent evidence shows that U.S. consumers are not following proper hand sanitation techniques. This conclusion is based on five cross-sectional studies summarized in the following slides two slides, as well as secondary data analysis of the CSFAN survey. With regards to hand sanitation, here research recommendations involve better understanding, how to persuade consumers to follow recommended hand sanitation behaviors.

From hand sanitation, we will now move into the topic of what techniques for fresh produce washing are associated with favorable food safety outcomes and to what extent do U.S. consumers follow them.

With regards to best practices, evidence based on a limited number of studies has shown that proper washing of vegetables and fruit at home or under laboratory simulation conditions to be associated with reduced microbial loads. This evidence is

derived from one cross-sectional study, one pre/post- home-based study and one laboratory simulation study. And this is the slide that summarizes those studies.

We can go to the next, please. With regards to consumer produce washing techniques, the Committee concludes that limited evidence shows that U.S. consumers are not following proper produce washing techniques. This conclusion is derived from two cross-sectional studies and also benefitted from analysis of the CSFAN survey.

The Committee identified a clear need to further examine the link between different washing techniques in the home kitchen and microbial and pesticide loads in diverse food products.

I will now move onto the last of the clean questions, which is to what extent do U.S. consumers clean their refrigerators following current guidelines.

The Committee's conclusion is that

consistent evidence shows that U.S. consumers do not clean their refrigerators following current guidelines. The evidence for this conclusion comes from the four cross-sectional studies summarized in the following slide.

I will now start addressing the three questions as to what techniques for cross- contamination prevention are associated with favorable food safety outcomes and how much are they followed by consumers in the U.S.

With regards to best practices to prevent cross-contamination, consistent evidence indicates that preventing cross-contamination in the home kitchen may reduce exposure to foodborne pathogens among U.S. consumers.

This conclusion is drawn from 13 studies including systematic reviews, comprehensive risk analysis, laboratory simulation studies, observational studies including a case- controlled study and a

randomized controlled trial.

The Committee identified key future needs in this area, including understand if and how home kitchen microbial cross-contamination during food preparation translates to actual risk for foodborne illness and further, examine the application of HACCP principles to prevent cross-contamination during food preparation in the home kitchen.

I will now present the section on temperature control which is divided into food thermometers and refrigerator/freezer thermometers.

With regard to food thermometers, the Committee concludes that consistent evidence shows that the great majority of U.S. consumers do not use food thermometers to properly assess internal cooking temperatures of meats while cooking.

With regards to refrigerator/freezer thermometers, the

Committee concludes that consistent evidence shows that U.S. consumers lack refrigerator and freezer thermometers in their homes. Whereas the food thermometer conclusion is derived from one systematic review and six cross-sectional studies summarized in this and the following slide, the evidence for that conclusion on refrigerator/freezer thermometers is drawn from analysis of the CSFAN survey, as well as to cross-sectional studies.

Next slide, please. Although not a formal FightBAC!® step, the 2005 Dietary Guidelines Advisory Committee report identified consumption of risky foods such as raw or undercooked animal-source products as a consumer behavior that should be discouraged. The Committee concurs with these recommendations and does so to find out to what extent do U.S. consumers ingest raw or undercooked animal-source food products.

The conclusion reached by the

Committee is that clear and consistent evidence shows that the consumption of raw or undercooked animal- source food products is common in the U.S., especially for eggs and egg-containing products. And I would like to add, to some extent ground beef products as well, including hamburgers and meatloaf.

This conclusion is arrived from eight studies, one meta-analysis, one systematic review and six cross-sectional studies.

There are serious food safety hazards associated with consumption of raw or undercooked animal-source products such as salmonella present in raw/undercooked eggs, E. coli in undercooked beef and Vibrio vulnificus and parahaemolyticus in raw oysters. In addition, even though the incidence of foodborne illness outbreaks reported from consumption of raw/undercooked seafood are relatively less common, the morbidity associated with each case can be extremely

severe and potentially fatal.

The Committee recommends for a better quantification and characterization of the risks associated with the consumption of raw or undercooked animal-source products. This work can lead to better risk communication when educating consumers about the health risks associated with these behaviors.

With regards to vulnerable populations, including pregnant women, older adults and college students that are vulnerable in other respects, the Committee found that all of these groups practice unsafe food handling and consumption behaviors, and that really the lack of adequate food safety practices is a problem is across the life cycle.

To conclude, the Committee recommends for the following overarching research needs to better guide food safety consumer education in the U.S.: First,

improve the validity of self-reported food safety behaviors. And this issue is huge, especially for behaviors related to hygiene, personal hygiene, and also hygiene and cleaning of the kitchen during food preparation because of the strong potential social desirability bias associated with self-reported behaviors.

Secondly, understand how to improve consumer's food safety knowledge, attitudes, self-efficacy, internal locus of control and ultimately behaviors. As I reported at the last meeting, a lot of the consumers don't believe that their home kitchens are likely to be sources for foodborne illness outbreaks. And furthermore, a large proportion of consumers feel that it is beyond their control and it is just within the hands of government and industry to protect them against the foodborne illnesses. So, we really need to use better focused behavior-based approaches to improve food

safety behaviors and this requires further research in diverse populations.

Thirdly, improve monitoring and surveillance to better understand the epidemiology of home- based foodborne illness outbreaks. Our colleagues at the CDC are kindly currently helping us to try to get a better assessment of the proportion of home-based foodborne illness outbreaks in the U.S. As you can imagine, it is not an easy task and a very, very large percent of home-based foodborne illness outbreaks get under-reported when they just affect a few people and not a congregation of people.

And lastly, it is important to examine the application of HACCP principles at the household level so that we can better educate consumers as to how improve their food safety behaviors while they are preparing different dishes, recipes and so on in their households.

So with this, I'm going to end the

in-home presentation and I'm open for any questions that you may have.

DR. VAN HORN: Excellent job, Rafael.

Any comments from the group?

DR. APPEL: Yes, this is Larry. Yes, Rafael, this was great. I always learn a lot from these food safety presentations.

I'm not quite sure it's a research recommendation, but I really think there needs to be some very creative and novel approaches to teaching the population food safety. You know, I was just thinking as you presented, like how do you get this information to the population? And I didn't see that as actually a research question, like, you know, have there been strategies that effectively test or that effectively disseminate these really important food safety principles? Maybe you could add that to your research recommendations and maybe, you know, CDC or some group would come up with a funding

initiative.

DR. PEREZ-ESCAMILLA: Absolutely, Larry. And it is very important, because there are very big initiatives that have invested a good amount of resources including FightBAC!®, Thermy™ and a number of USDA food safety education initiatives as well. But as far as I know, they have not been evaluated in a way to give us a good idea of how effective they have been at changing food behaviors.

DR. APPEL: And it might involve creative use of health information technologies.

DR. PEREZ-ESCAMILLA: Yes.

DR. APPEL: You know, Twitter, you know, just mass broadcasts to people, because I think a lot of people are cooking now who never were taught how to cook, not just what they eat, but how to cook.

DR. PEREZ-ESCAMILLA: Yes, your point is well-taken and will be included, Larry. Thank you very much.

DR. PEARSON: Rafael, this is no longer part of a secondary education curriculum, is it? I mean, is there any, you know, high schools at all that teach this anymore. I mean, when I went to school, we learned about this, you know, as part of health things, but that's all gone, I'd imagine.

DR. PEREZ-ESCAMILLA: Yes, as Miriam brought up at the last meeting, you know, the return of cooking lessons for kids in the schools I think is something that we need to do to improve their ability to choose better foods and so on. And as part of that, food safety education should be a very important component.

DR. PEARSON: I mean, part of this is the degradation of our cooperative extension services. You know, with funding cuts, this has been one of the casualties, I'm afraid.

DR. PEREZ-ESCAMILLA: And it's a

problem, but also the very, very strong emphasis on reading and math curriculums in the schools when there is no time even for recess anymore or for kids to wash their hands.

DR. PEARSON: You can't do math if you're sick.

DR. NELSON: This is Miriam. Rafael, maybe this is beyond the purview of this Committee, but I'm assuming we're not going to deal at all with some of the issues about food safety with the food supply and, you know, the sort of homogenization of, you know, it all coming together and not knowing where it's coming from, et cetera, et cetera?

DR. PEREZ-ESCAMILLA: Except for fish.

DR. NELSON: Okay. Except for fish.

DR. PEREZ-ESCAMILLA: The fish we're doing a fairly reasonable job.

DR. NELSON: Okay.

DR. PEREZ-ESCAMILLA: But you're right, it's very --

DR. NELSON: That any given hamburger will have, you know, 1,000 cows in it and things like that.

DR. PEREZ-ESCAMILLA: Yes.

DR. CLEMENS: This is Roger. Good point, Miriam. It was a deliberate position that we took to focus on the home except for fish or in seafood.

DR. NELSON: Okay. Yes, that's reasonable. I think we should just make sure that we're stating we're not dealing with that other issue.

DR. CLEMENS: That's right. Good point.

Okay. Rafael, let's go onto one of our favorite topics here, seafood.

DR. PEREZ-ESCAMILLA: Yes, I'm getting hungry now. Okay.

DR. CLEMENS: It's almost lunch time where I am.

DR. PEREZ-ESCAMILLA: So, the question that I will be addressing now is what are the benefits in relationship to the risks for seafood consumption.

Following the IOM recommendation, the Committee defined seafood as consumer-obtained finish, shellfish and mollusks coming from marine and fresh water sources. And I think that it should be commercially-obtained finish, shellfish, et cetera.

In 2004, EPA and FDA jointly issued a fish advisory targeting women of reproductive age and young children based on the potential adverse consequences of methyl mercury exposure on the fetus and child's neurological development. This advisory set weekly limits for seafood consumption and specifically advised the target individuals to avoid the consumption of large predatory fish, limit the consumption of albacore or white tuna and call for consumers to pay attention

to local advisories for locally-caught freshwater fish.

As stated at the last public meeting, the question regarding benefit/risk ratios needs to be revisited as there are uncertainties about risks previously assumed. There are no existing recommendations for groups not targeted by the 2004 advisory. And most importantly, the public at large is confused, and this includes consumers and also OB/GENS and other health care providers.

The evidence was based on studies published between 2007 and 2009, with the exception of the seminal work by Mozaffarian and Rimm that was identified via a hand review of references from included citations.

The Committee conclusion is that consistent evidence shows that health benefits derived from the consumption of a variety of cooked seafood in the U.S. in amounts recommended by the Committee outweigh the risks associated with methyl mercury and

persistent organic pollutant exposure, even among vulnerable populations defined as women of reproductive age who are pregnant or nursing, and children ages 12 and younger.

Overall, consumers can safely eat up to 12 ounces of a variety of cooked seafood per week, provided that they pay attention to local seafood advisories and limit their intake of large predatory ocean fish. Furthermore, the Committee reaffirms that women of reproductive age who are pregnant or nursing and children ages 12 and younger should avoid large predatory fish.

The implications of the Committee findings are that seafood is a healthy food choice that can be safely promoted provided that the types and sources of seafood to be avoided are clearly communicated to consumers.

The conclusion is supported by quantitative and qualitative benefit/risk assessments, some of which took only into account risks associated with methyl mercury

for heart disease among adults and child's neurological development. Others took into account cancer risks associated with exposure to POPs and others took into account risks associated with both POPs or persistent organic pollutants and methyl mercury exposure.

From the benefit side, most analysis took into account the cardiovascular benefits and neurological development benefits associated with consumption of omega-3 PUFAs found in seafood.

This slide summarizes three quantitative benefit/risk analysis that I presented at the last public meeting, so I will not dwell much into them. I do want to emphasize, however, that with regards to methyl mercury the analysis by Ginsberg and Toal with 16 seafood species available in Connecticut found that consumers can indeed consume as much as six ounces per day for about half of the fishes analyzed without

exceeding upper tolerable limits of methyl mercury exposure. So, it is very likely that consumers can obtain the omega-3 PUFAs that they need without exceeding the methyl mercury upper tolerable levels provided they choose the right kinds of seafood.

Also, as previously discussed, the analysis by Mozaffarian and Rimm finds a very favorable benefit/risk ratio for salmon consumption, either farmed or wild, after taking into account potential cancer risks associated with POPs exposure.

Regarding the concern of higher POPs levels in farmed versus wild fish, the Committee found that in general consumers in North America can consume the levels of omega-3 PUFAs needed without exceeding the upper tolerable levels of either POPs or methyl mercury intakes. Indeed, the benefit/risk analyses by Gochfeld and Burger based on fish available in New Jersey document that the benefit threshold for

neurodevelopmental and cardiovascular disease outcomes appear to be at seafood intakes below the harm threshold associated with methyl mercury consumption. And although I did not find data with regard to POPs, it is possible that a similar finding would be obtained.

As the Fatty Acid Subcommittee reported yesterday, a sensitivity analysis was done to model the impact on nutrient adequacy of four ounces per week of seafoods high in omega-3 PUFAs, eight ounces per week of seafood with both high and low levels of omega-3 PUFAs, and 12 ounces per week of seafood low in omega-3 PUFAs.

The last part of my presentation will be on the work to report on an exploratory analysis led by Kellie O'Connell from CNPP USDA to examine if there are potential concerns regarding the use of seafood fishes high in methyl mercury in the USDA seafood patterns.

The conclusion is that amounts of

seafood in USDA Patterns do not raise evident potential concerns for the 11 possibly problematic seafood varieties identified in our literature review that are relatively high in methyl mercury content. Of the 11 seafood species for, that is, shark, king mackerel, tilefish, yellow fish, yellowfin tuna and Atlantic cod are not in the pattern. Sea bass, white tuna, light tuna, lobster and halibut are in the pattern, but at amounts substantially below the levels of potential concern. For swordfish where any level could potentially be of concern, the level among the three scenarios that were simulated are minimal, ranging from zero to 0.04 ounces per week.

In terms of research needs, the Committee recommends to conduct consumer risk communication research to determine how best to translate these seafood benefit/risk findings to the public.

The Committee also recommends to

conduct further research to further refine seafood intake recommendations for U.S. consumers by simulating the presence of more beneficial and detrimental compounds that are as we know simultaneously present in seafood. And also, it is very important that the country improves current seafood consumption surveillance and monitoring, and especially we are concerned about the monitoring of the food safety of seafood produced via aquaculture. As it was presented yesterday by the Fatty Acid Subcommittee, a very large proportion of the fish and seafood that we're consuming these days and times is already coming from seafood farms, and it is important that the monitoring of the whole chain including the feeding that the fish and other seafood get, the quality of the water in which they're grown in the farm, and also what happens during the transportation of these products gets properly monitored. So it is not only an issue of having sustainable aquaculture, but

also an issue of having aquaculture that is safe for U.S. consumers.

Thank you, and I am open for questions.

DR. CLEMENS: Nice work. This is Rog. Nice work, Rafael. I appreciate your closing remarks in particular as we look at aquaculture. I know that has been quite a controversial issue. This issue will be discussed in a little bit more detail as we know in the chapter on Food Safety and Technology. I think the numbers are as much as 84 percent of our import fish is through aquaculture, so monitoring is going to be really critical. I know that the National Oceanographic Association, NOAA, is actually increasing its monitoring capabilities and has a very active and aggressive program to do just that. So, it's quite an exciting time in which we live so we can provide a very safe and abundant food supply through aquaculture.

Any other remarks?

DR. PEARSON: This is Tom Pearson. Rafael, has there been any studies on the messaging on large predatory fish, how that's actually understood and followed? The recommendations have been around for a while. Obviously very highly-educated groups are probably are doing all right with that, but how about some of the others?

DR. PEREZ-ESCAMILLA: Yes, large predatory fish is not consumed in large quantities in the U.S., but I can say that the overall impact of the federal advisory, the 2004 EPA/FDA Federal Advisory, was to reduce the consumption of fish and other seafood among pregnant women to a point, where as Roger has reported before, OB/GYNs tend to recommend women not to consume any seafood at all.

DR. PEARSON: At all. Yes, that's the problem. That's the point, that there's a two-edged sword here.

DR. PEREZ-ESCAMILLA: Yes.

DR. PEARSON: One obviously is not to consume the predatory fish, or to be confused and still eat predatory fish. And the other edge is not to eat any fish at all.

DR. PEREZ-ESCAMILLA: Right. So I think that the risk communication research is not there.

DR. PEARSON: Right.

DR. PEREZ-ESCAMILLA: I think we need to do a much better job. And also regarding Christine's question from yesterday, we know that, you know, women also have the option of consuming the omega-3 PUFAs in the form of fish oil supplements. And I think that at the end of the day my take on this right now is that it should be a decision between the mom- to-be and her health care provider, but it must be an informed decision that is grounded on an adequate assessment of benefit and risk.

DR. PEARSON: Thank you.

DR. RIMM: This is Eric. Is there

actually something that we could put in there that says -- maybe you did comment on it, saying that on average 94 percent of the fish consumed in this country, you know, is not an issue?

DR. PEREZ-ESCAMILLA: Yes, and I think that's where we're heading with the wonderful data that was analyzed. The wonderful job that Kellie O'Connell did analyzing the data from the USDA Food Patterns.

DR. RIMM: Great. Because, I mean, this was a great presentation, but I think you're exactly right, and it was brought up yesterday that most obstetricians just tell their patients to take an omega-3 supplement because of you just never know. But I just think that that's the wrong message because we'd like to be focusing on the whole food and the protein package in addition to the omega-3 fatty acids.

DR. PEREZ-ESCAMILLA: Yes.

DR. CLEMENS: Right.

DR. VAN HORN: Yes, I would just like to reiterate that. This is Linda. And, you know, again along the line of having a consistent message where we're talking about the benefits of omega-3, we can't then say but don't eat fish, you know? So, I think that's valuable.

The other thing, as we discussed last time, and maybe, Roger, you're going to raise this again now, would be the whole emphasis on improving the standards within aquaculture because of the presentation that we had last time that clearly indicated that in order to keep up with America's potential increased interest in consuming fish, we hope, you know, the only way that's going to be accommodated is if we have additional production and availability, and aquaculture becomes, again, front and center as the logical transition to that. But of course, maintaining safety throughout that effort

would be a high priority.

DR. CLEMENS: That's an excellent remark, Linda. Thank you so much. We know that the National Oceanic and Atmospheric Administration, NOAA, is actually primarily responsible for the aquaculture movement in this country. And they have new re-insurgence, if you will, to look at overseeing aquaculture production, whether it be for a food supply or for a medication. So it's quite exciting to see what's going on there. Hopefully we'll get some of the tidbits of the conference that's been held as we speak today so that we can incorporate it into our chapter on Food Safety and Technology.

DR. VAN HORN: That's great.

DR. FUKAGAWA: This is Naomi. The other consideration is that as our economy becomes more global, we do have to be cognizant of aquaculture that may be occurring elsewhere for which we may not be able to monitor as well.

DR. CLEMENS: Yes, that's an excellent comment, Naomi, and my experience is that in fact some of the products we're monitoring we see that the antibiotic levels exceed the standards we have here in the United States. So to your excellent comment, we clearly need to be more diligent in our monitoring process.

DR. NELSON: And this is Mim. I think as we have it right now in the integration and translation chapter, this is a piece of it that we think is important.

DR. CLEMENS: Excellent. Thank you, Mim.

DR. PEREZ-ESCAMILLA: I think with regards to Naomi's excellent comment, in general the food safety monitoring and surveillance system in the U.S. with regards to products that are coming from abroad is very reactive.

DR. FUKAGAWA: Right.

DR. PEREZ-ESCAMILLA: If something

really bad happens, then we take action and we work with the countries to set up better ways of monitoring the standards before the products leave the countries. And I think the conclusion from the 2006 IOM Food Safety Report was for the system to become much more proactive so that we can prevent a lot of outbreaks before they happen. And I think that's a challenge that we have been discussing and the recent efforts by the current administration to improve food safety monitoring and surveillance.

DR. CLEMENS: That's right. You know, and that's actually incorporated in two bills that are on the Hill as we speak.

Okay. So let's move onto technology so we can get the last two chapters. And thank you very much, Kellie, for moving that on.

There are three basic questions we asked in terms of in-home technologies. Obviously, here it says to what extent are

recently developed technology materials designed to improve food safety as designed. The comments on food safety are indicated down below, which they're designed to improve food safety. And effective.

Well, let's look at the data. And fortunately, it's Grade III. There isn't very much in the public scientific literature to examine the various technologies that could be available or should be available in the home level. But most of these technologies are applied in the commercial level.

So we were able to find three studies, and they're identified here in front of you. And they examined two excellent comments made by Rafael already relative to home thermometers. Then we looked at antibacterial products. Again, Rafael addressed that in terms of hand washing, and we also included a study to address wipes and food contact surfaces and various sanitizers you might find in a home today.

We looked at how those studies indicated that the consumers are actually using these kinds of products. Were they following manufacturing instructions? Were they using thermometers correctly? And do the proper usage of those products actually decrease potential microbial burden in the protected products?

Not all thermometers were tested, of course, not all wipes were assessed and not all sanitizers could be, but those that were they in fact provided in most cases that provided correct cook information. And also there's always a potential of course of overcooking and undercooking a product, the point that Rafael brought out in his remarks. So obviously the bottom line, we need to assure using these types of technologies to assure that we actually have a safe food supply in the home against foodborne diseases.

Next. So we looked at the evidence that was available. We had seven

studies to look at consumer technologies, cleaning surface materials, cutting boards and sanitizers used in the home. There are a number of studies, but you see here by this graphic there weren't very many studies in each one of these very important topics.

Next. Those topics and studies were summarized in this block, cross-sectional studies. You see the youthfulness of these kinds of studies. They're really fresh out of the block. We clearly need to have more studies to corroborate various settings.

Next. And, again, two more studies indicated here relative to cutting boards and food contact surfaces. You just can't wipe down a surface and hope that it's wiped clean.

Next. Well, here are some additional studies indicated here. What type of technology is available? Again, in this particular case they're looking at studies of the impact of pH as acidity, even using a salt

solution, the brining, that's one of Larry's favorite topics. And you will see what will happen in terms of microbial loads. And we have other opportunities looking at Salmonella typhimurium, which was an indicator of contamination. In this case it was used because it's very commonly found in vegetables such as onion and arugula we might have in our daily salads.

Next. And then we looked at to what extent technologies are being used to effectively improve the shelf life of foods. Unfortunately, again we don't have enough peer reviewed literature, as in none. So clearly this is an indicator, an opportunity for us to examine what technologies can be improved or added to food products or environments of food products that in fact we can prolong the shelf stability of the foods that you and I consume. Therefore, we don't have a conclusion to offer. But it will be addressed in the chapter that Rafael and I and the entire food

safety team are putting together.

And the last comment here -- Kellie, next slide. Yes. And which recently developed effective technology standards in fact are accessible, cost-effective and acceptable to recommend to various consumers? Again, none was located in the peer review literature. And we're trying to pull out some data relative to cost for thermometers, but other than those data we don't have sufficient information to draw a conclusion to assist the various consumers.

So at the end of the day, we have information on hand wipes, we have limited information on food contact surface material and it really shows that other than thermometers and the washing material that Rafael -- to which he referred, that you really don't have a lot of scientific information to support the next level of technology that could be applied to foods in the home so that we can actually provide a

food-safe environment in the home.

And next. What we have in food safety technology. By the way, this was a really great effort by Rafael and Naomi, as well as the great team of Kellie, Donna, Holly and Shirley. Thank you so much for your terrific effort.

And this also shows that food safety has become quite an issue across America and around the world. It's time that we invest more information and more research into this area of food safety in the home, as well as the commercial environment.

Thank you so much. Comments?

(No audible response.)

DR. CLEMENS: None.

DR. VAN HORN: I think you wowed the crowd. Let's put it that way.

DR. CLEMENS: Yes, right. We're all going to go home and be sure that we're wiping down our counters and be sure we're washing our hands, and use the thermometers

correctly.

DR. RIMM: Well, Roger, some of the issues are that because there were -- this is Eric -- that because lots of technologies are used before we get the foods home, we don't need them at home. Isn't that true? You know, I guess, I don't know, radiating beef or -- irradiating beef or other factors that, you know, because the food is safe before we get it home, we don't need it?

DR. CLEMENS: Well, I think that's --

DR. RIMM: That's just stating the obvious. I don't know.

DR. CLEMENS: Yes, you raise a very good point, Eric. I think there is that assumption. And as we both know, the comments made by Rafael this morning, that in fact we cannot always assume that.

DR. RIMM: Right.

DR. CLEMENS: And with the new regulations and the new technologies and new

enforcement technologies, it's still up to the consumer to remain diligent. So obviously we have to be careful. When in doubt, throw it out. As the comments say, if there's something in the refrigerator that doesn't smell good, it probably isn't good.

So we still have to practice the same type of procedures that the food industry practices in the production facility. If you look at the last remark made by Rafael, he mentions in his closing remarks about HACCP. That's applicable whether in the food industry or any industry that in fact you need to understand the various critical control points in the home. Where in fact where contamination can occur, it very much could occur.

So when you use an instrument once, you need to put it in the wash bag or put it in the basin for dirty dishes. You just can't overuse and then go from one product, say fruits and vegetables and use the

same knife for chicken, then go back and cut up your vegetables. That clearly is a compromise in separation. So we need to stick with the basic principles of chilling and obviously food separation and cleanliness.

DR. PEARSON: Roger, is there any evidence whatsoever that this is done on a secondary prevention basis? In other words, after you've gotten the person through their Salmonella attack, is there any evidence that they're actually instructed at that time about how to do it better so they don't come back next week?

DR. CLEMENS: That's an excellent comment, Tom. To the best of my knowledge the answer is no.

DR. PEARSON: Well, I'll bet it's no.

DR. CLEMENS: Yes, and that's just really an excellent -- I know that the USDA has some terrific educational programs. I

know Rafael mentioned several of them in his remarks. But the answer is no. I think most attending in the ER, for example, Tom, that I don't think they get any instruction on how to better manage their home.

DR. PEARSON: Yes, and it's a good interface between HHS and Department of Agriculture, but, you know, getting some of those materials out to health care providers, particularly if it's a reportable disease, which many of these are.

DR. CLEMENS: And they are indeed. It's really interesting that the USDA -- they want to be updated and they have software ready to be updated. So, if there's an entrepreneur out there that can actually work with the USDA. They can update the materials so that we can better educate the consumer.

Well speaking about educating consumers, what a great segue, we want to talk about dietary patterns, so I'll toss it over now to Larry Appel and his team.

DR. FUKAGAWA: Before you move on though, I think one important thing that Tom had brought up was the, you know, declining use and support of the extension services. Because in many ways our country could potentially benefit from a health extension.

DR. PEARSON: Amen.

DR. FUKAGAWA: Yes.

DR. CLEMENS: Amen to that, your excellent comment. And I know my friends at Cornell, that's what they do. They talk about food safety all the time. And with the extension services being cut back, we're going to have less interface with the consumers.

DR. VAN HORN: Well, Vermont wants to do it.

DR. RIMM: Well, Roger, can I ask one other thing? Again, this is my naivete when it comes to food safety, like most of us. It's all sort of anecdotally-based. But I heard several times that using existing technology such as the microwave to kill

certain things before, you know, cooking them or not -- you know, just to be sure that if you don't cook them to the right amount of time that sticking something in the microwave is effective. Is that just pure anecdotal, or is there any evidence to suggest that that should be something that's discussed?

DR. CLEMENS: We did not discuss it. I don't recall doing that. Thank you for that remark. The home microwave was not intended to eliminate foodborne illness. The microwave at home is intended to cook.

DR. RIMM: Yes, well, that's true. But is it effective? If you put something in there for 30 seconds, does it actually -- it's not 100 percent effective?

DR. CLEMENS: Well, the literature would say that most people use the microwave to warm, not to cook. There are data out there that say, Eric, in effect if you don't follow instructions by the manufacturer, well, now you actually could increase your risk for

an issue because it will not adequately cook the material. So, that's the undercooked issue that Rafael brings up. You need to follow instructions.

DR. VAN HORN: All right. Well, with that excellent comment, and thank you, Roger and Rafael and Eric, and everyone, in regard to the food safety. We really appreciate all the work that everyone did and we look forward to the chapter that will bring all of these important issues together.

We're now ready to move into the final phase of our webinar. And before I turn it over to Larry, I just would like to provide a little bit of an introduction to what's going to happen next, in that we are planning to have two additional chapters in this report, one of which will be called the Total Diet Chapter. And this aspect, dietary patterns, will be front and center as a part of that in regard to what we discussed earlier. In other words, how does one

actually take all this information and put it into a reasonable eating approach, eating pattern that involves all the various foods and food groups and yet still meets nutrient adequacy, as well as not exceeding caloric needs.

And so we're going to be launching that discussion now. It's a work in progress. The individuals that you see identified as Committee members are clearly people who have been leading the other chapters, and we hope will have specific and succinct contributions for this report on the basis of the work that was done as far as developing their own respective chapters.

In addition, we will then also hear from Naomi and Mim, who are leading the Translational and Integration Chapter, another new chapter for this report that we hope will address some of the other very important and relevant aspects of developing those eating patterns and implementing them on the basis of

the environmental issues and looking for additional effort and support, as well as research to look not only at food and nutrients, but how people need to actually go about choosing them, cooking them, eating them and meeting all these nutrient requirements.

So with that by way of introduction, Larry, are you ready to go into --

DR. APPEL: Ready to roll. So, yes, once again, this has been a team effort and it's really been incredibly stimulating, and I thank everybody on this list on this slide and a lot of other people, too. We're treading in territory that hasn't occurred before, trying to understand the effect of dietary patterns, synthesize the evidence and present it.

So here are some of the topics we're going to cover. The selection of dietary patterns, the description of those dietary patterns, the health benefits and

issues for discussion.

So, next slide. So our first research question is what is the effect of different dietary patterns including DASH dietary patterns; the Mediterranean diet, which probably should be plural; vegetarian diet, again plural; Okinawan diet, probably plural, on blood pressure in adults.

Next slide. So right now this should probably be labeled draft conclusion, too, but the impression we have at this point is that we can state that several distinct dietary patterns lower blood pressure.

Next slide. So there were NEL searches. And since this is a new question, we didn't have a date range included for this one on adults. Mostly trials, but also some cohort studies. Excluded people with chronic disease whose main outcome was blood pressure. And the search strategies listed.

Next slide. So there were 21 studies that were included; 16 randomized

trial, five prospective studies. And the types of studies that were identified in part, this is -- you know, because we also had these as search criteria, were Mediterranean diet, DASH diet, vegetarian diet and other or mixed.

Next. So this is a summary slide of what was found. A lot of interest in DASH, and several of these were randomized trials. Twelve were deemed of positive quality. Two were neutral. And the overwhelming majority; 13 for systolic, 11 of 14 for diastolic, documented reductions in blood pressure.

Mediterranean diet. And there actually hasn't been as much work, and that was my impression beforehand and that was sort of verified by the search.

And for vegetarian, actually they're interesting. It's mostly randomized trials, several small studies. There might be an observational study that wasn't included, but basically there's a reasonable body of evidence that vegetarian-style diets are

associated with lower blood pressure, and similar for these other mixed patterns.

Next slide. So the next research question was what are the effect of different dietary patterns on cardiovascular disease, stroke, and total mortality in adults.

Next slide. A similar strategy, but just had a different outcomes, cardiovascular disease or coronary heart disease, stroke, and total mortality.

By the way, you know, we are interested in cancer, but we felt that this was covered in the World Cancer Research Fund data synthesis that was recently done.

So anyway, for these clinical outcomes, 43 studies. You know, systematic reviews, very few randomized trials of course, and then a lot of cohorts, some case controlled studies. In terms of diet types, a lot of work on Mediterranean diets, and from a variety of different regions. Then DASH, DASH variants and vegetarian, or studies of

vegetarians and other types of diet, 15.

So this is sort of a crude summary. Again, DASH, mostly prospective studies and they were associated with lower risk of CVD. Sometimes these were like -- it scored differently. I mean, I know that Eric's group has done work on this, a variety of different scoring systems. Most of them are really for cardiovascular disease, total or CHD, not too many just on stroke. That's understandable since that's a less frequent outcome.

Mediterranean diet, there has been a large number of cohort studies, as well as some meta-analysis and synthesis. There was one in BMJ; I think it was two or three years ago, that was really quite good. And the vast majority of those cohort studies documented benefits on total mortality and CVD.

And similar for vegetarian diets for CVD.

And then there's sort of this

catchall other or mixed where they have different sort of types of analyses constructing sort of patterns based on clusters and other types of analyses. And again, it seems to be there are benefits of certain clusterings of food groups.

Next slide. So we're just working on how to synthesize those, but I think we can probably make a statement that several distinct dietary patterns are associated with a reduced risk of chronic disease, but we haven't really worked on the conclusion or implications at this stage. This is a work in progress.

The other area where we spent quite a bit of time is trying to describe these dietary patterns, and both sort of descriptions in terms of words, but also provide ideas of the types of food groups and nutrients that are provided in the dietary pattern. And this has proved to be very, very challenging because of the very heterogeneous

manner in which these studies are presented, and a lot of the studies present a very incomplete picture. So there will be studies that don't provide, let's say, the amount of sodium or potassium that is provided or the amount of alcohol that is typically consumed. So it's not perfect.

But this is where we are right now. The patterns that we're considering, and we're probably going to clip this a bit, DASH pattern with low-sodium. Then we have three options for the Mediterranean diet. We had a discussion with Frank Hu about this earlier, and we were thinking that we might have a U.S. version versus a European. And there are a lot of complexities actually about how to select that European version because there is no one Mediterranean diet. That's a problem that's plagued the field. It's not something that we just uncovered.

Likewise, there are studies now of Japanese diets that have traditionally been

associated with a reduced risk of CHD. An Okinawan diet that is associated with longevity and a reduced risk of not just cardiovascular disease, but many chronic diseases.

And then we have dietary patterns that are based on modeling, and we had a little bit of discussion earlier today in Shelly's section. But we have four dietary patterns that the USDA has developed. We have to work on the terminology, but that might not be critical for our report, but it will be critical in translation. There's the base pattern called plant-based, lacto-ovo, vegetarian and vegan. And all those, as was pointed out earlier, meet the nutrient requirements with, you know, slight deviations from goals.

But we don't for those have as much data on disease prevention, but we do have a lot of data on nutrient adequacy. In contrast, we have for Mediterranean,

Japanese/Okinawan -- well, maybe more for Mediterranean and less so for Japanese/Okinawan, good data on clinical outcomes from cohort studies. And for DASH we have data on nutrient adequacy, blood pressure, and some data from cohort studies. So that seems to be a pattern where we actually have, you know, data across several domains that are relevant for health.

So you can also see some of the complexity when you look at the bottom part of that page, the nutrients where you see quite a bit of variation in how nutrients are presented; sometimes percent of kcals, sometimes grams. I think we're going to try to as best we can present data in a uniform way across studies, but that will require some data manipulation beyond what was originally published or developed.

Next slide. So what we're planning on doing is developing some tables related to health outcomes. So it will be the

usual, what we've developed or similar to what we've developed for other nutrient/disease relationships. This is one for patterns in blood pressure, CVD outcomes. And these are like three studies, and we'll be developing those. They'll probably be on the Web. I'm not quite sure they'll be in the chapter, but we'll have some summary tables on patterns.

Next slide. So we'll develop some research recommendations. This is clearly a work in progress. I can tell you one research recommendation that's going to be right up front is conduct research on how to synthesize results from these different types of studies, because I think we're going to be -- well, I think it's a major step forward to discuss dietary patterns and try to provide guidance on this. It's been challenging in terms of synthesizing results, and that actually might be a little bit beyond dietary guidelines, but I still think that's an important area.

I think that might be it for the

slides. And I guess I'll at this point open it up for questions and comments.

DR. RIMM: Larry, this is Eric. That was really nice. Thanks. So I guess I'm trying to think of a way to make your life easier because it does look like a complicated task. The one thing I might suggest is taking out of the question, and maybe even out of your summaries, is the sort of Japanese/Okinawan diet. I think the Okinawan diet is a proprietary thing. If you're not going to have Atkins and all the other diets in there, we probably should take out the Okinawan diet.

And I'm not sure how applicable the Japanese diet and the Okinawan diet outcomes are, only because they're so distinctly different in all the other lifestyles that go along with the diet. You know, I guess if we had a huge -- if we had 50 percent of the population that was Japanese that lived that way in addition, then I guess

we could focus on that. But I think that it sounds like you're going to be spending a lot of time putting tables together as it is, and that might help you a little bit.

The other thing I guess is the healthy eating index, which is something that was derived by the government to see how well people adhere to the Dietary Guidelines. And I don't know if that's considered a pattern, but it is sort of a pattern of adherence.

DR. APPEL: Yes, you know, let me go in reverse. I think that this is a work in progress, and I'm learning a lot as we go. And I think documenting the potential benefits of recommended eating habits is, I guess, the best way to quantify it might be with the HEI.

DR. RIMM: Right. It's just I know that a lot of -- I mean, we've done some work and I know others have used that as a measure of, you know, a healthy diet. And, you know, to show what has been done might show the contrast in the Mediterranean diet

and the DASH diet, you know, do a fair bit better than the healthy eating index. And maybe -- I mean, the healthy eating index may be a moving target because as the guidelines change, so will that -- I assume so will that description of a dietary pattern.

DR. APPEL: Yes, I think we'd have to be careful to see if -- I mean, the HEI based on 2005, and that's what the USDA Dietary Patterns are based on, not earlier sets of recommendations. But maybe we should see if there's been anything -- I don't know if that was, you know, captured in our searches.

You know, your first point, we did talk about this, you know, about whether to include Japanese/Okinawan. First of all, there's less data on Okinawan for sure, and there's less data both on nutrient composition and health outcomes, with the exception of pretty well-documented, actually very well-documented evidence of longevity, you know,

highest number of centenarians and life expectancy in that prefectorate compared to other prefectorates in Japan. But I think part of the rationale, and it might be the -- is to be a little bit less Western-centric in this set of guidelines.

DR. RIMM: This partly came up because I know someone who's selling a book and a diet called The Okinawan Diet --

DR. APPEL: Yes, but --

DR. RIMM: -- you know, like Atkins and other things. You know, it's proprietary, which maybe it's fine, it's just that we try to make a habit of not doing that.

DR. APPEL: Yes.

DR. RIMM: This is fine. I just brought it up because, you know --

DR. APPEL: Yes. Yes, you know, the thing about it is though, Eric, I think there obviously -- I mean, there are also people making money off of DASH, not myself. And there's a book on it, and I know people --

but, you know, I haven't gotten any royalties from that or anything else.

But I think that the Okinawan diet is a diet that was consumed by free-living people for which we have okay but not perfect information on nutrient composition and okay but not perfect information on outcomes, which looked pretty good. So I think that's why we're including it. And I really was, you know, in my naivete unaware of the commercial aspects of this.

DR. RIMM: Yes, because it's just the diet and not all the other aspects of Okinawan living? I mean, I don't know. I haven't looked at the study.

DR. APPEL: Yes, I think the same thing can though be applied to, you know, Mediterranean. I think that there are aspects of -- you know, to be honest with you, I can't fully separate it out. I don't think we're in a position to do that. I wouldn't be surprised, but it has a lot of the features

that we are advocating as part of a healthy diet. You know, their saturated fat intake is, you know, is minuscule. As best we can tell, their sodium intake is reduced. Potassium intake is quite high. Actually, their vegetable intake is really quite high. So in many but not all aspects of the pattern. So I --

DR. RIMM: Oh, that part I agree. I just meant like the exercise and the, you know, lack of --

DR. APPEL: Oh, yes. Yes.

DR. RIMM: Okay. Yes.

DR. APPEL: But I also think that's true for example of the Mediterranean lifestyle. I mean, the original -- I mean, people who, you know, ate the diet in Crete were also climbing trees to get their food, you know? They're actually very physically active.

DR. RIMM: Right.

DR. APPEL: So, you know, it's

hard to totally separate everything out. But, you know, actually there's one point that I didn't raise in the early discussion I think is important, is that, you know, in displaying these, I don't think we can say that any of them is ideal or perfect, particularly the free-living. Because, you know, there are aspects -- for example, some of the Mediterranean-style diets had higher saturated fat than we would recommend. So it's not as though when we have this, when we present this table, we're going to have many caveats, you know, that they still can be better. And we're just, at least for the observed diets, documenting what people are consuming.

DR. FUKAGAWA: Well, I think this is a perfect segue to introduce a fourth-generation Japanese person who's going to translate and synthesize.

DR. VAN HORN: That's a great segue, you're right. But let me add one thing before we leave, because we do want to talk

about the translation, and you are the perfect person to do it. But I think the only additional point I'd add to the discussion that we just had is first to point out that the Okinawan diet was 85 percent carbohydrates, which of course, you know, is much more higher than what we would necessarily advocate. And as you point out, Larry, there, you know, is no one perfect diet, but that does certainly represent another approach to an eating pattern that's high in carbohydrates, complex carbohydrates.

But for this Total Diet Chapter, in addition to what's been presented thus far, some additional themes that we're planning to incorporate are the whole focus on use of fresh, whole, minimally-processed foods. So the Committee has discussed over and over again the need to emphasize the benefits of nutrients coming from foods, from whole foods, and wanting to make recommendations and provide information on how to go about doing

that.

And then also of course this concept that we have said from the minute we started this webinar, which is the whole issue of understanding nutrient density versus energy density, and discussing exactly how that gets translated by selection of these various food groups. And that's why each of the chairs of these respective chapters will have hopefully something to contribute to how we actually address that within each of those categories. So, hopefully that will take shape and develop in the time we have ahead.

And then also the last thing I would mention is even in terms of our listing in the slide related to the macro/micronutrients, we'd have to also I think add a slash for dietary fiber. Our goal again is to try to unify and provide overarching recognition of shortfall nutrients, shortfall foods, and illustrating how by shifting the focus to the shortfall

foods and increasing them, some of these other nutrient problems actually will fall into place. And I think, you know, that's how the healthy eating index can also be applied to this whole process. But, you know, it's just a matter of trying to illustrate that, you know, a lot of these nutrients would be of less concern if the foods that provide them were in the proper balance.

So with that, Naomi, please do proceed with the Translational Integration Chapter.

DR. FUKAGAWA: Thank you. And I will have to have a disclaimer that I am fourth- generation Japanese, but I don't necessarily adhere to any of these dietary patterns.

But anyway, the purpose of this chapter which will be worked on by Mim, Rafael, Eric, Chris, Tom, Roger and staff members from HHS and USDA is really to identify some cross- cutting issues that have

come out in the science-based chapter reviews that we've just heard about over the last several meetings. And hopefully, what we'll try to do is to synthesize some of the disparate findings and narrow them down to some key points about what we think the evidence is really saying about the relationship between diet and health.

And in our earlier discussions we've tentatively identified four primary points that we think we will address in this chapter. And the first one of them is to address the issue of the incidence and prevalence of overweight and obesity in the U.S, which obviously has to have a life stage focus and has a number of bullet points under that.

The second one is to reconcile issues that we've heard about over the last two days regarding added sugars, solid fats, refined grains and sodium in the diet and relate this to issues of consumer behavior,

some of the food policies that might exist, and issues of food production and safety that we've talked about earlier today.

The third one dovetails well with this whole diet chapter that Linda addressed and that Larry spoke about, was whether or not one needs to consider recommending or suggesting that we have a shift in food intake patterns in order to achieve better health for the nation while still dealing with the variety of differences that we have culturally, ethnically and with lifestyle and food preferences.

And the fourth one is probably a no-brainer in that it relates to trying to encourage Americans to adhere to and meet some of the 2008 Physical Activity Guidelines that were presented and for which Mim was a very important member of that Committee.

And so, over the next few weeks our subcommittee will hopefully be able to get together and address this.

And wondered if, Mim, do you have any additional comments about where we're headed?

DR. NELSON: No, I think that was a good synthesis. The only thing I'd say is in point 3, what we've been talking about is to shift the food intake patterns to a more plant-based diet, that it's not just a shift, but again that meets the sort of cultural and heritage needs of different people. And then I think the context of this is the sort of integration.

And then the translation piece is much more -- I think that what we will be focusing on with this chapter, sort of surrounding the whole chapter, is that we need a coordinated strategic plan for meeting these targets. And that it's not just -- it's beyond -- as we say, far beyond individual behavior change. And that all segments of society are going to have to come together to make these changes, because we've seen with

many of these in the past with the Dietary Guidelines with no budging of actual changes in food intake patterns, so that it needs to be multi-sector.

And then I think that's the sort of key elements. As I look at our notes, that's it.

DR. FUKAGAWA: Any --

DR. NELSON: I mean, if I could just sort of just summarize this, the idea is just to really try to change the overall food environment for people so that it makes it easier over time for them to meet the Guidelines and to be as healthy as possible.

DR. VAN HORN: All right. Other comments from any other Committee members at this point? Anything that you have burning on your heart that we haven't addressed today or yesterday that you want to be sure gets officially heard today?

(No audible response.)

DR. VAN HORN: All right. If not,

then I would like to just briefly summarize the next steps as we near the end of our journey together, and then I'll turn it over to Rob for some closing comments.

Between now and the final meeting, each subcommittee will finalize their conclusion statements in response to the feedback received at this meeting and ongoing discussions.

The chairs will lead the drafting of the content of their respective chapters and work with our science writer on the organization and flow within their chapter, as well as contributing to the content of the Total Diet Chapter and the Translation Integration Chapter, as we just discussed.

There will be a sixth and final meeting planned for next month after the entire report has been drafted. This meeting will be again held via webinar for the public and will be announced in a Federal Register notice upcoming. At this meeting we'll

present and come to consensus on the full content of our advisory report and we're going to depart as friends. After which, this report will undergo final formatting and we'll formally submit the advisory report to the Secretaries of USDA and HHS who will post it for public comment.

Once again, any final comments or questions from anyone on the Committee?

(No audible response.)

DR. VAN HORN: If not, I would like to offer my great and deep appreciation to every single person who participated to make this such a rich and full two days. We may have been snowed out in February, but I think we more than accomplished a full agenda over these last couple of days, and I just want to thank all the members, as well as all the staff for their incredible dedication to making this all come together.

And with that, I would just like to ask Rob to close us up.

DR. RIMM: Hey, Linda, before you do that --

DR. VAN HORN: Yes?

DR. RIMM: -- can I just point out in case that your comment was misinterpreted, actually I think this group has been quite collegial throughout. I'm quite impressed with the fact that I don't think it's individuals patting each other on the back just because we want to pat each other on the back, but actually I think we have worked quite well together. So, I'll just give my kudos to you and to Naomi for having us be collegial throughout.

DR. VAN HORN: Thank you. It's a wonderful group and a tremendous opportunity to work with fine people all interested in a common good. So, thank you all.

Rob?

DR. POST: Well, thank you, Linda. And I speak on behalf of the Center and my HHS colleague Rear Admiral Penny Slade-Sawyer

when I say, wow, this is clearly -- the Committee has done fantastic work. It's undertaken a tremendous amount of important work to date that's been reflected in the discussion over the past two days.

We definitely look forward to the continued work of the Committee as it moves towards the completion of the advisory report.

I'd like to take a moment quickly to recognize the staff of USDA and HHS that's supported the work of the Committee through this intricate process. You've heard Committee members refer to them during this message or during this meeting, and I'd like to recognize them.

In addition to Carole Davis from CNPP and Kathryn McMurry from ODPHP, the Office of Disease Prevention and Health Promotion in HHS, who I introduced yesterday, and the Senior Co-Executive Secretary of USDA and HHS, I also want to recognize Shanthy Bowman from the Agricultural Research Service

of USDA and Holly McPeak from ODPHP of HHS, of the Health and Human Services Department, who are also Co-Executive Secretaries of the Committee.

We have the Dietary Guidelines Management Team, who in addition to the four Co-Executive Secretaries, also include Jan Adams and Trish Britten, Eve Essery, Patricia Guenther, Kellie O'Connell and Collette Rihane. And we thank them for their contributions. And from HHS, I'd like to mention Shirley Blakely and Rachael Hayes.

And I'd also like to give recognition to our science writer and editor, Anne Brown Rodgers, who is assisting in pulling together the final report.

We also have the evidence analysis division at CNPP, which is directed by Joanne Spahn, and includes Jean Altman, Donna Blum-Kemelor, Eve Essery, who I also mentioned is on the Dietary Guidelines Management Team, Thomas Fungwe, Joan Lyon, Patricia MacNeil,

Molly McGrane, Julie Obbagy, and Yat Ping Wong, who is our research librarian from the National Agricultural Library.

We'd also like to recognize our national service volunteer evidence abstractors who are depicted here on this slide, and on this slide, and also on this slide. As you can see, this is a very intricate process and involves an awful lot of dedicated and hard- working individuals.

Last but not least, we'd like to thank our contract support staff and consultants for their efforts and contributions. And again, I want to express our deep appreciation for the service that the Advisory Committee is providing to the federal government and the cooperative work of all the subcommittees and the staff.

And with that, thank you, Linda. And we're concluding here from the Department of Agriculture. Linda?

DR. VAN HORN: Thank you.

DR. POST: Okay. With that, I guess we can conclude our meeting. Thank you.

DR. VAN HORN: Thank you.

(Whereupon, the meeting was adjourned at 4:00 p.m.)

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