
SKIN CAROTENOID SCREENING TO INDEX FRUIT AND VEGETABLE INTAKE

INTRODUCING THE 'VEGGIE METER'

AS A NEW SCREENING TOOL FOR THE CHILD CARE HEALTH PROGRAM



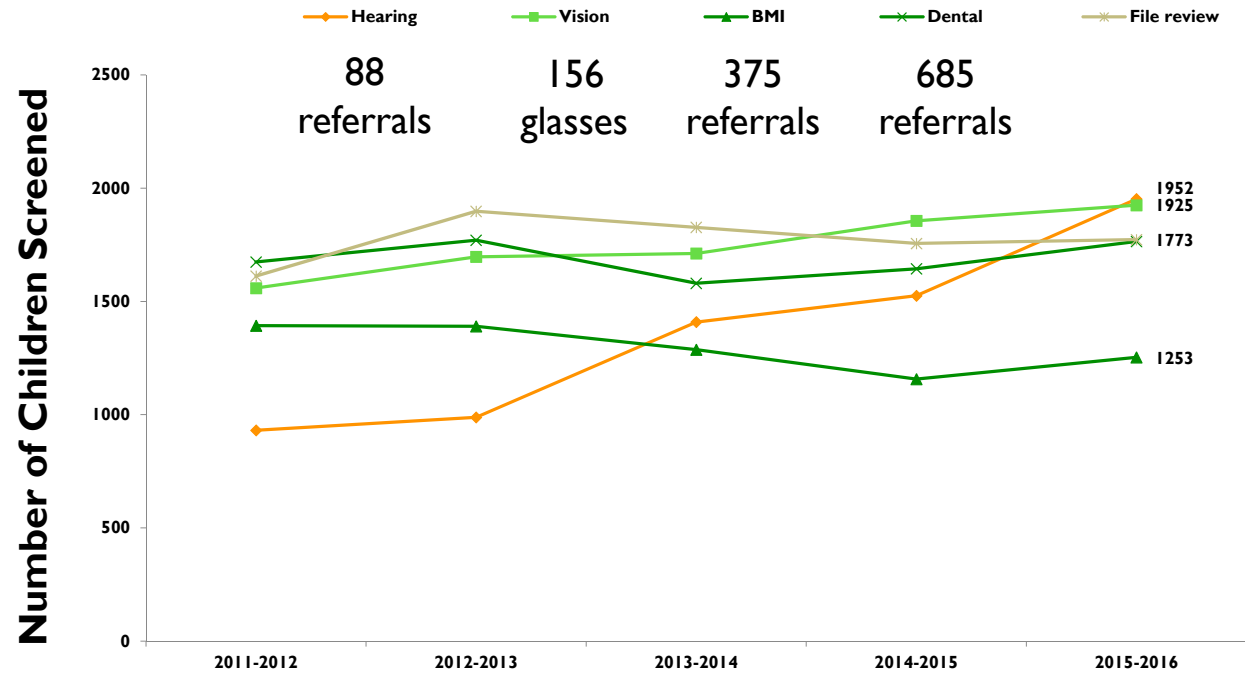
AGENDA

- Context for skin carotenoid screening
- Demonstration of the Veggie Meter
- Questions?

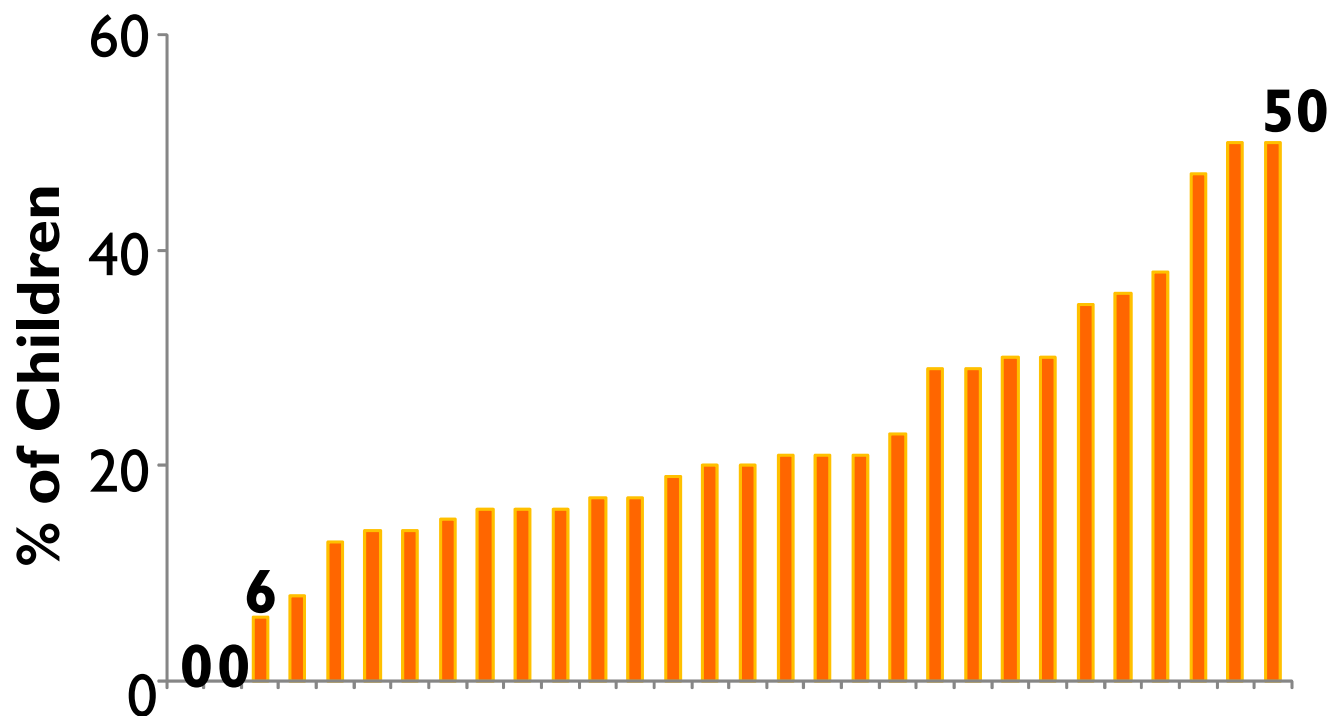
THE SFDPH CHILD CARE HEALTH PROGRAM OFFERS ANNUAL HEALTH SCREENINGS

- Health file review
- Vision
- Hearing
- Dental
- Nutrition

CCHP uses the data to link children to health care resources



NUTRITION STATUS VARIES BY CHILD CARE CENTER



To improve nutrition status, the best practice is to link *child care centers* to resources that improve the child's daily nutrition and physical activity environment

10+ BMI percentile point gain by child care center, 2011-2012



excellence in childhood
nutrition + physical activity



About

Preview

Events

Resources

Partners

Healthy Apple Award

What is the Healthy Apple Program?

The Healthy Apple Program is a FREE, voluntary opportunity for child care providers to assess their program's nutrition and/or physical activity practices, receive support to make improvements, and be recognized for meeting best practices. The goal of the initiative is to empower and assist child care providers in promoting and establishing lifelong healthy habits, ultimately aiming to reduce rates of childhood obesity.

Register and get started on your first assessment today!

[Forgot your username or password?](#)

 Remember me

register

login

Who Should Participate in the Healthy Apple Program?

ANY child care provider in San Francisco who wants to inspire children in their care to eat healthier foods and be more active should participate. Staff, teachers, or anyone offering care at a center, family child care home, or unlicensed setting are all encouraged to take part.

Why Participate in the Healthy Apple Program?

Child care providers play an important role promoting early patterns that grow into lifelong healthy practices.

- Get a snapshot of your nutrition and physical activity environment to help you identify the best course of action.
- Choose improvement goals and work at your own pace with support from Healthy Apple.
- Get tools to monitor your progress and measure change.

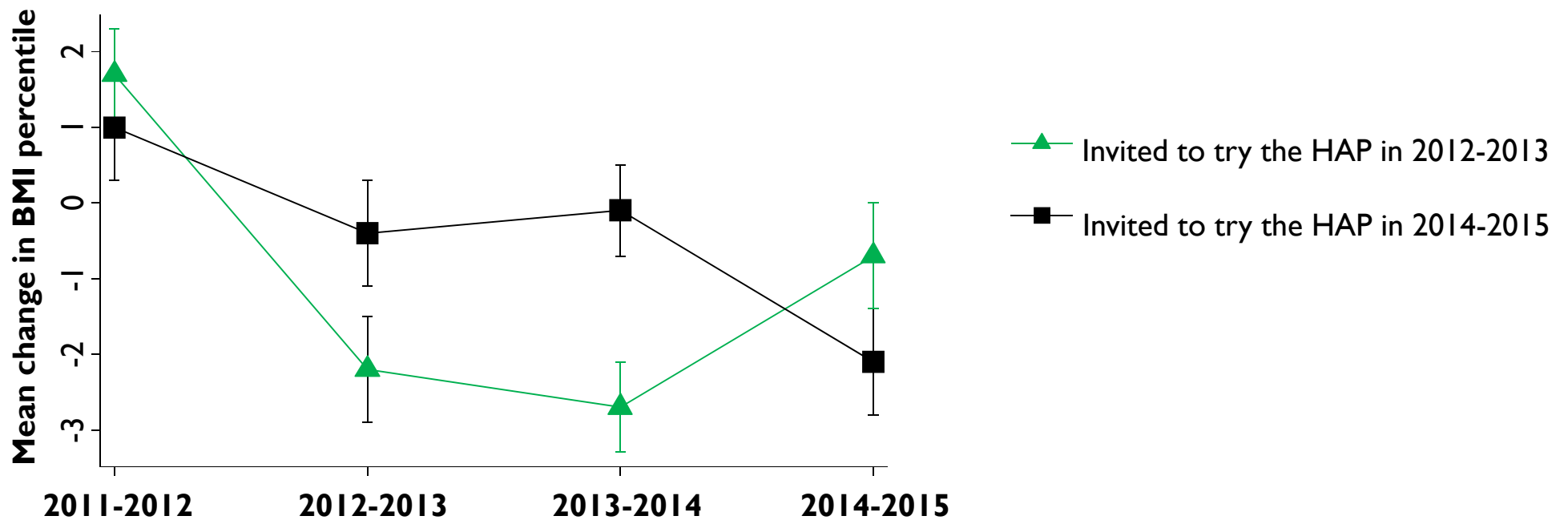
Announcements

JOIN US!

Check the [Events](#) page for upcoming workshops as well as orientations designed for all participants. Learn more about Healthy Apple and get help using the tools!

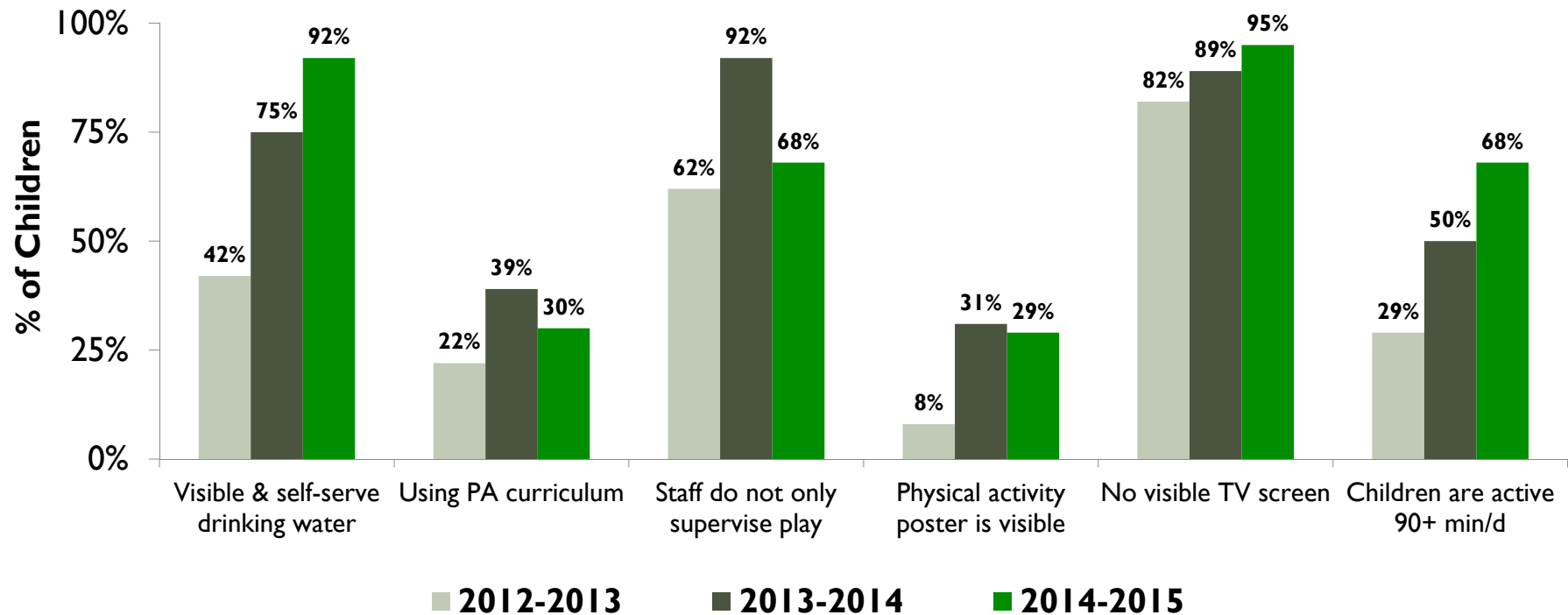
Space is limited.
[Contact us](#) to sign up.

THE HEALTHY APPLE PROGRAM RESULTED IN SIGNIFICANTLY IMPROVED CHANGE IN BMI PERCENTILE



Annual mean change in BMI percentile from Fall to Spring screenings for children ages 2-5y in child care centers that participated in the San Francisco Child Care Health Program and were randomly selected to pilot the Health Apple Program

CCHP OBSERVED CHANGE IN CHILD CARE CENTER NUTRITION & PA CHARACTERISTICS



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- Health file review
- Vision
- Hearing
- Dental
- Nutrition: Measure height & weight

Energy balance
Diet *quantity*
MACRONutrients

UNKNOWN:
Are they eating
Fruit & Vegetables
???

Vitamins & Minerals
Diet *quality*
MICRONutrients

INCREASING FRUIT & VEGETABLE INTAKE IS A PUBLIC HEALTH PRIORITY

National

National
Prevention Strategy
(2011) – USDHHS

Let's Move! Child
Care Campaign
(2012)

State

California
Wellness Plan
(2014) – CDPH

CA Preschool
SHINE Program
(2013)

Local

San Francisco
Community Health
Improvement Plan
(2012)

SNAP-Ed funded
Nutrition
Education and
Obesity Prevention
Branch

Nutrition and Weight Status

Overview

Objectives

Interventions & Resources

National Snapshots

Goal

Promote health and reduce chronic disease risk through the consumption of healthful diets and achievement and maintenance of healthy body weights.

HP2020 targets
Energy balance
AND
Diet quality

Overview

The Nutrition and Weight Status objectives for Healthy People 2020 reflect strong science supporting the health benefits of eating a healthful diet and maintaining a healthy body weight. The objectives also emphasize that efforts to change diet and weight should address individual behaviors, as well as the policies and environments that support these behaviors in settings such as schools, worksites, health care organizations, and communities.

Americans with a healthful diet:

- Consume a variety of nutrient-dense foods within and across the food groups, especially whole grains, fruits, vegetables, low-fat or fat-free milk or milk products, and lean meats and other protein sources.
- Limit the intake of saturated and trans fats, cholesterol, added sugars, sodium (salt), and alcohol.
- Limit caloric intake to meet caloric needs.¹



San Francisco Community Health Improvement Plan

▪ December 2012 ▪



PRIORITY 2: INCREASE HEALTHY EATING + PHYSICAL ACTIVITY

| GOAL | OBJECTIVE (Source) |
|------|---|
| | ii. ↑ daily consumption of fruits and vegetables (CHIS) |

Major Findings Health Needs

Healthy Eating



Good nutrition means getting the right amount of nutrients from healthy foods and drinks. Good nutrition is essential from infancy to old age.



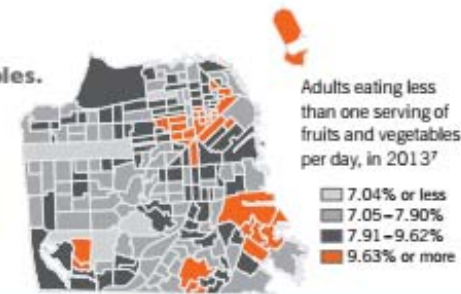
The USDA's MyPlate.org recommends that fruits and vegetables make up at least half of our plate, or approximately five servings a day.¹

Leading medical and health associations recommend drinking water instead of sugary drinks.² The Institute of Medicine recommends 13 cups of liquids per for men and 9 cups for women who live in temperate climates.³

A healthy diet promotes health and reduces chronic disease risk. It is critical for growth, development, physical and cognitive function, reproduction, mental health, immunity, stamina, and long-term good health.⁷

Many San Franciscans do not eat enough fruits and vegetables.

2 out of 3 youth and **4 out of 5 adults** do not eat 5 or more servings of fruits or vegetables daily.^{4,5}



Many San Franciscans do not drink enough water. 1 out of 3 adults drinks less than 4 glasses of water per day.⁸

Many do drink sugary drinks. 1 out of 3 adults consume at least one sugar sweetened beverage a day.⁶

Barriers to Healthy Eating

Many factors influence healthy eating, including cost and income, food availability, transportation, time, and availability of facilities to store and cook foods, and food preferences. Factors vary across the city and result in neighborhood differences in consumption.

Many cannot afford healthy foods.

44% of adults living below 200% of the federal poverty level are not able to afford enough food at some time during the year.⁹

Not everyone has access to a kitchen.

According to the American Community Survey, approximately 20,756 occupied housing units in San Francisco do not have complete kitchen facilities.⁹

Healthy foods are not evenly distributed across the city.

While some neighborhoods, including Chinatown, have a dense array of food options, others, especially Oceanview/Merced/Ingleside, Bayview Hunters Point, Visitation Valley, and Treasure Island have less access to healthy food outlets.¹⁰

Not cooking is the new normal. On average, San Francisco area households spend **48% of their food dollars** on foods and non alcoholic beverages prepared away from home, such as meals from restaurants, and school or workplace cafeterias, or vending machines.¹¹

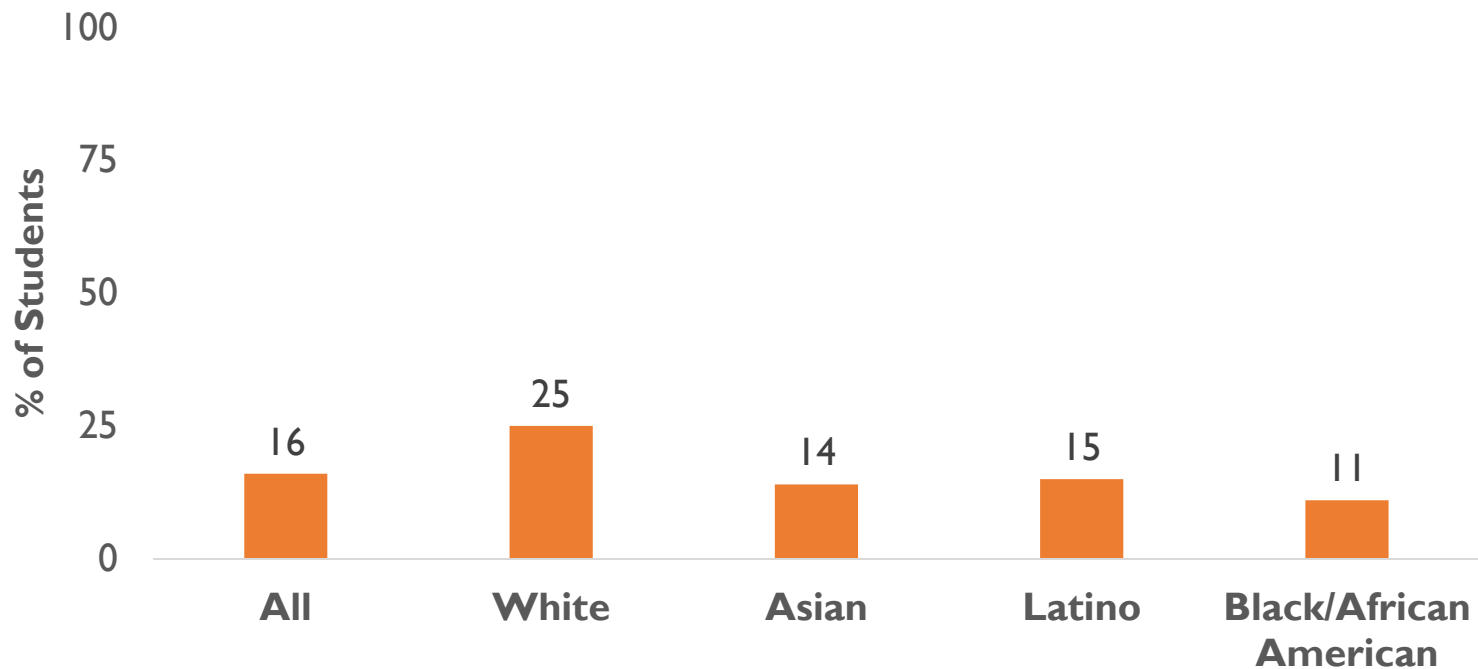
Unfamiliar fruits and vegetables are scary. Childcare providers participating in the Child and Adult Care Food Program who serve low income children in San Francisco report that children are unwilling to eat unfamiliar fruits and vegetables.

"Some children just won't eat the different vegetables..." —*Healthy Apple Program, San Francisco Children's Council*

"We offer a lot of fruit and vegetables, but the kids are scared of them..." —*San Francisco Food Vendor*



16% OF SFUSD HIGH SCHOOL STUDENTS REPORT EATING 5+ SERVINGS OF FRUITS AND VEGETABLES DAILY



■ Percentage of SFUSD high school students who ate 5-plus servings of fruit and/or vegetables daily, 2009-2013

Data source: CHIS



because child care matters

- Many parents still struggle to get to school on-time. During that scramble to cor to school, they often do not give their children enough time to eat breakfast. The kids sometimes come hungry and they get out of sorts in the classroom. We ser snack at I lam and that may not be soon enough for some of our hungrier children.
- We encounter challenges when parents make special meal accommodation requests that are also nutritionally equivalent to what the CACFP requires us to provide children with each meal, most of the times we are able to accommodate but there are times that we have to discuss with families other ways to support them.
- **The challenges that I have are some children just won't eat the different vegetable no matter what.** I do continue to present the different vegetables and fruits although some children don't want to try it. The children get a half cup of 100% juice along with a half cup of water mixed each day. One cup of milk per day and 8 ounces of water once a day. This is not a problem for the children they adapt to this well. I think that with me eating the same thing that they eat helps them to want to.
- Nearby Spaces are unsafe, limited resources and parents fundraise to bring in Yoga instructors, Zumba instructors, Charity and The Yum Band, Yukelenny and Tree Frog Treks so the programs are spread over many resources which are limited.





Highest Training Needs Identified

- **Toddler nutrition education**
- Regularly using curriculum (N&PA)
- Infant physical activity ideas
- Screen time
- Policy development and Parent Ed. (N&PA)
- Expanding menu cycle
- Family style meals, authoritative feeding, positive feeding practices



15

introductions to each new food may be required



excellence in childhood
nutrition + physical activity



Dashboard

Update Info

Events

Resources

Logout

1. Foods/Beverages
Provided ?

2. Feeding Environment
& Practices !

3. Nutrition Education, Professional
Development & Policy ✓

4. Breastfeeding
& Infant Feeding ?

5. Summary ?

6. Submit
Your Assessment ?



Raegan's Radical Rainbow Readers Nutrition Assessment #1

Children begin learning healthy eating habits at a very young age, and their bodies are growing rapidly. Additionally, most children eat 50% to 75% of their daily calories at child care. It is important that food served at child care is nutritious and that providers and staff model and encourage healthy eating habits.

*Hover or mouse over the words in **blue font** for definitions and information. (Will not work on tablets, smart phones or other touch devices.)*

SECTION 1: Foods/Beverages Provided

FOODS PROVIDED

1. Our program offers **fruit**:

- 3 times per week or less (Half-day: 2 times per week or less)
- 4 times per week (Half-day: 3 times per week)
- 1 time per day (Half-day: 4 times per week)
- 2 times per day or more (Half-day: 1 time per day or more)

2. Our program offers fruit that is fresh, frozen, or canned in its own juice, not in syrup:

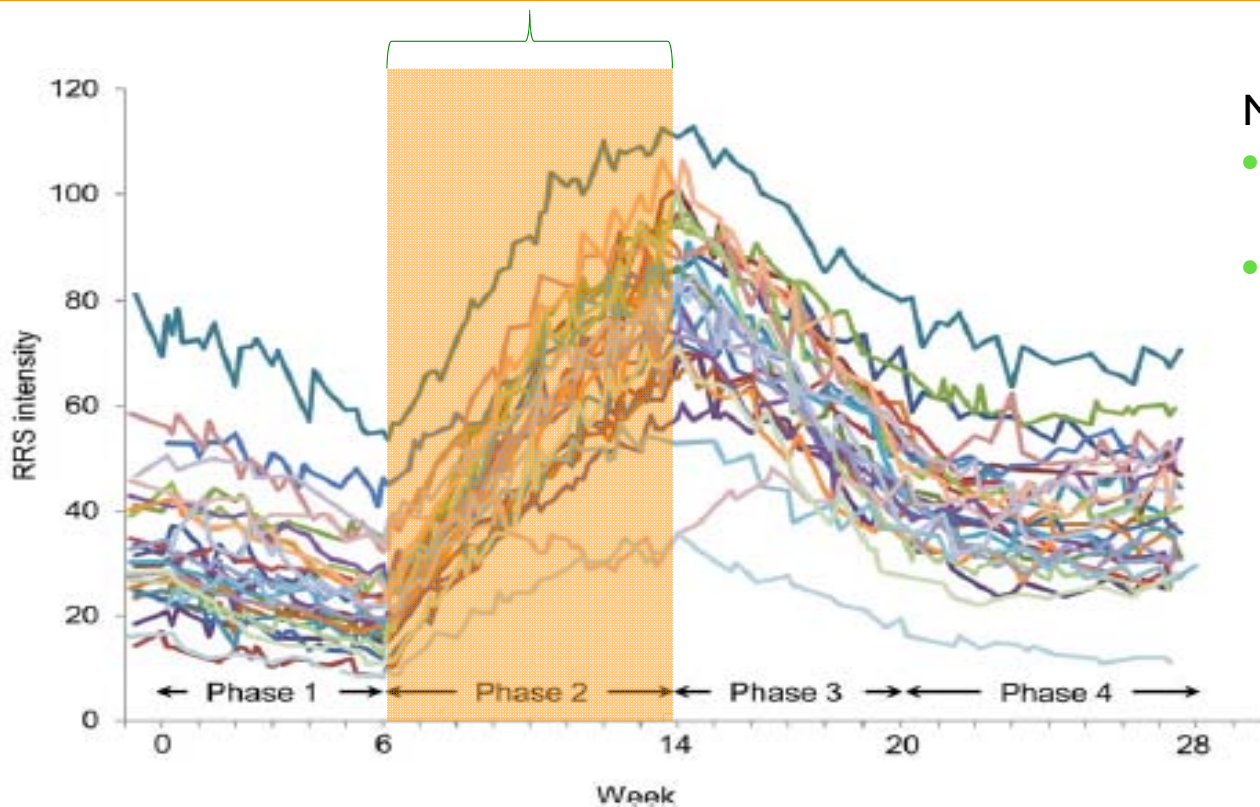
- Rarely or never/Fruit is never offered
- Sometimes
- Often
- Every time fruit is offered

3. Our program offers **vegetables**:

INTRODUCING THE 'VEGGIE-METER'



CHANGE IN SKIN CAROTENOID LEVELS REFLECTS CHANGE IN FRUIT AND VEGETABLE INTAKE



Menu based on ChooseMyPlate.gov:

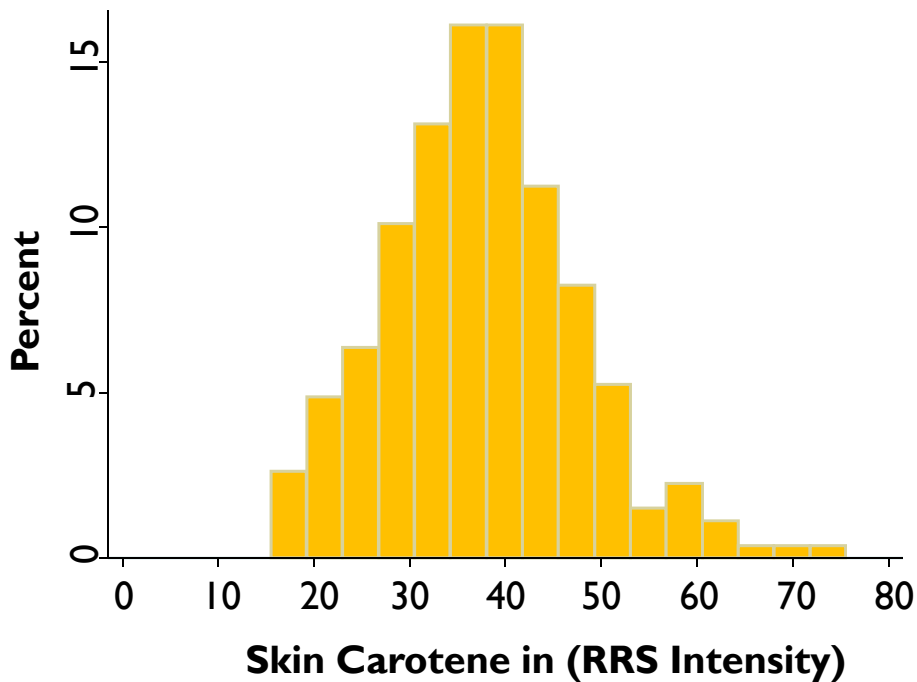
- 1046 g V/F daily = 3.0–4.5-cup equivalents Vegetables
 - 1.0–2.5-cup equivalents Fruit
- V/F were served cooked, raw, and as 100% juice

Source: Jahns et al, 2014

VEGGIE METERS ARE USED TO INDEX FRUITS AND VEGETABLES IN MANY PLACES AND FOR MANY POPULATION GROUPS

| Population | Location | Method | Reference |
|---|------------------------------|---|---|
| Pre-term infants (n = 16 foreskin study) (n = 40 feeding study) | Salt Lake City, Utah | Resonance Raman spectroscopy correlated with harvested foreskin tissue and serum carotenoids (HPLC). Found that human milk-fed infants had higher carotenoid status than formula-fed infants. | Chan GM, Chan MM, Gellermann W, Ermakov I, Ermakova M, Bhosale P, Bernstein P, Rau C. Resonance Raman spectroscopy and the preterm infant carotenoid status. <i>J Ped Gastroent Nutr</i> 2013;56:556-9. |
| Economically disadvantaged preschool children (n = 381) | Urban Centers in Connecticut | Resonance Raman spectroscopy correlated with modified Block Kids Questionnaire and Preschool-Adapted Liking Survey filled out by parents | Scarmo S, Henebery K, Peracchio H, Cartmel B, Lin H, Ermakov IV, Gellermann W, Bernstein PS, Duffy VB, Mayne ST. Skin carotenoid status measured by resonance Raman spectroscopy as a biomarker of fruit and vegetable intake in preschool children. <i>Eur J Clin Nutr</i> 2012;66:555-60. |
| Children ages 5-17 (n = 45) | Cache County, Utah | Validated resonance Raman spectroscopy against serum carotenoid measurements (HPLC) | Aguilar SS, Wengreen HJ, Lefevre M, Madden GJ, Gast J. Skin carotenoids: a biomarker of fruit and vegetable intake in children. <i>J Acad Nutr Diet</i> 2014;14:174-80. |
| Children ages 5-17 (n = 58) | Cache County, Utah | Gave children juice high or low in carotenoids, or placebo juice. Found that consumption of carotenoid-rich juice increased skin carotenoid status. | Aguilar SS, Wengreen HJ, Dew J. Skin carotenoid response to a high-carotenoid juice in children: A randomized clinical trial. <i>J Acad Nutr Diet</i> 2015;15:1771-8. |

SKIN CAROTENE DISTRIBUTION FOR CHILDREN AGES 3-5Y IN CCHP 'VEGGIE METER' PILOT, MAY 2015



- Bell shaped, normal distribution
- ~**4 fold** between-child variation, Range: 16-76
- Significant between-center difference: 33 vs. 39
- Children at Center 1 were **2 times** more likely to have a value below 30 than children at Centers 2 or 3 (OR=2.2, 95%CI: 1.0-4.7, p=0.04)

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Energy balance
MACRONutrients

Diet *quality*
MICRONutrients

CHILD CARE HEALTH PROGRAM VEGGIE METER SCREENING

- Offered as part of the voluntary screenings in Fall & Spring
- Results will be used to:
 - Teach children about fruit and vegetables, their body's response, and the health benefits
 - Link child care centers to resources to promote fruit and vegetables – respond to local request for nutrition education
 - Inform citywide public health program planning and evaluation – respond to national and local Health Improvement Goals



PARTNERS SUPPORTING CHILD CARE HEALTH PROGRAM VEGGIE METER SCREENING

- SFDPH Feeling Good Project
- Drs. Werner Gellermann and Igor Ermakov, University of Utah
- Dr. Rachel Scherr, UC Davis, Department of Nutrition
- Dr. Leah Wigham, Paso del Norte Institute For Healthy Living

Please let us know if you would like to join an Advisory Board for CCHP Veggie Meter screening