

The nutritional adequacy of vegetarian menu substitutions in urban Kansas childcare centers

Caitlin Jindrich RDN, LD

Thesis and APE

May 26, 2021

Overview

- Introduction
- Purpose
- Methodology
- Results
- Conclusions
- Competencies

Introduction

- Adequate nutritional intake of high importance [1]
- Significant number of US children receiving childcare in a center setting [2]
- Menu substitutions are taking place in childcare
- Lack of knowledge and understanding



<https://www.spectrumnews.org/news/symptoms-in-children-with-autism-follow-diverse-paths/>

“The **goal** of the CACFP is to **improve** and **maintain** the **health** and **nutritional** status of **children** and adults, promote the development of **good eating habits** and integrate **nutritious** food service with organized **child** and adult day **care services**.”



<http://dugnetwork.org/resource/child-and-adult-care-food-program-cacfp/>

CHILD MEAL PATTERN

Lunch and Supper (Select all five components for a reimbursable meal)				
Food Components and Food Items ¹	Ages 1-2	Ages 3-5	Ages 6-12	Ages 13-18 ² (at-risk afterschool programs and emergency shelters)
Fluid Milk ³	4 fluid ounces	6 fluid ounces	8 fluid ounces	8 fluid ounces
Meat/meat alternates				
Lean meat, poultry, or fish	1 ounce	1 ½ ounce	2 ounces	2 ounces
Tofu, soy product, or alternate protein products ⁴	1 ounce	1 ½ ounce	2 ounces	2 ounces
Cheese	1 ounce	1 ½ ounce	2 ounces	2 ounces
Large egg	½	¾	1	1
Cooked dry beans or peas	¼ cup	⅜ cup	½ cup	½ cup
Peanut butter or soy nut butter or other nut or seed butters	2 tbsp	3 tbsp	4 tbsp	4 tbsp
Yogurt, plain or flavored unsweetened or sweetened ⁵	4 ounces or ½ cup	6 ounces or ¾ cup	8 ounces or 1 cup	8 ounces or 1 cup
Vegetables ⁶	⅛ cup	¼ cup	½ cup	½ cup
Fruits ^{6,7}	⅛ cup	¼ cup	½ cup	½ cup
Grains (oz eq) ^{8,9}				
Whole grain-rich or enriched bread	½ slice	½ slice	1 slice	1 slice
Whole grain-rich or enriched bread product, such as biscuit, roll or muffin	½ serving	½ serving	1 serving	1 serving
Whole grain-rich, enriched or fortified cooked breakfast cereal ¹⁰ , cereal grain, and/or pasta	¼ cup	¼ cup	½ cup	½ cup

¹ Must serve all five components for a reimbursable meal. Offer versus serve is an option for at-risk afterschool participants.

https://www.odbcacfp.org/wp-content/uploads/2017/09/CACFP_childmealpattern.pdf

Vegetarian diet

- Is a healthy eating pattern [3,4]
- Growing sales [5]
- Make up 4% of the U.S. population [6]
 - 3% in the Midwest



<https://www.aicr.org/resources/blog/few-american-adults-meet-fruit-veggie-goals-raising-cancer-risk/>

CHILD MEAL PATTERN

Lunch and Supper (Select all five components for a reimbursable meal)				
Food Components and Food Items ¹	Ages 1-2	Ages 3-5	Ages 6-12	Ages 13-18 ² (at-risk afterschool programs and emergency shelters)
Fluid Milk ³	4 fluid ounces	6 fluid ounces	8 fluid ounces	8 fluid ounces
Meat/meat alternates				
Lean meat, poultry, or fish	1 ounce	1 ½ ounce	2 ounces	2 ounces
Tofu, soy product, or alternate protein products ⁴	1 ounce	1 ½ ounce	2 ounces	2 ounces
Cheese	1 ounce	1 ½ ounce	2 ounces	2 ounces
Large egg	½	¾	1	1
Cooked dry beans or peas	¼ cup	⅜ cup	½ cup	½ cup
Peanut butter or soy nut butter or other nut or seed butters	2 tbsp	3 tbsp	4 tbsp	4 tbsp
Yogurt, plain or flavored unsweetened or sweetened ⁵	4 ounces or ½ cup	6 ounces or ¾ cup	8 ounces or 1 cup	8 ounces or 1 cup

https://www.odbcacfp.org/wp-content/uploads/2017/09/CACFP_childmealpattern.pdf

COVID-19

- Kansas stay-home order issued March 2020 [7]
- Childcare centers deemed essential



<https://www.hpr.org/post/kansas-issues-stay-home-order-kansas-counties-most-impacted-covid-19>

PURPOSE

To answer the following research questions:

1. What is the status of CACFP childcare foodservice operations as they relate to vegetarian menu substitutions?
2. Is there a difference in diet quality between the standard meals and the vegetarian alternative meals served at CACFP childcare centers in urban Kansas areas?
3. Is there a difference in nutritional content between the standard meals and the vegetarian alternative meals served at CACFP childcare centers in urban Kansas areas?

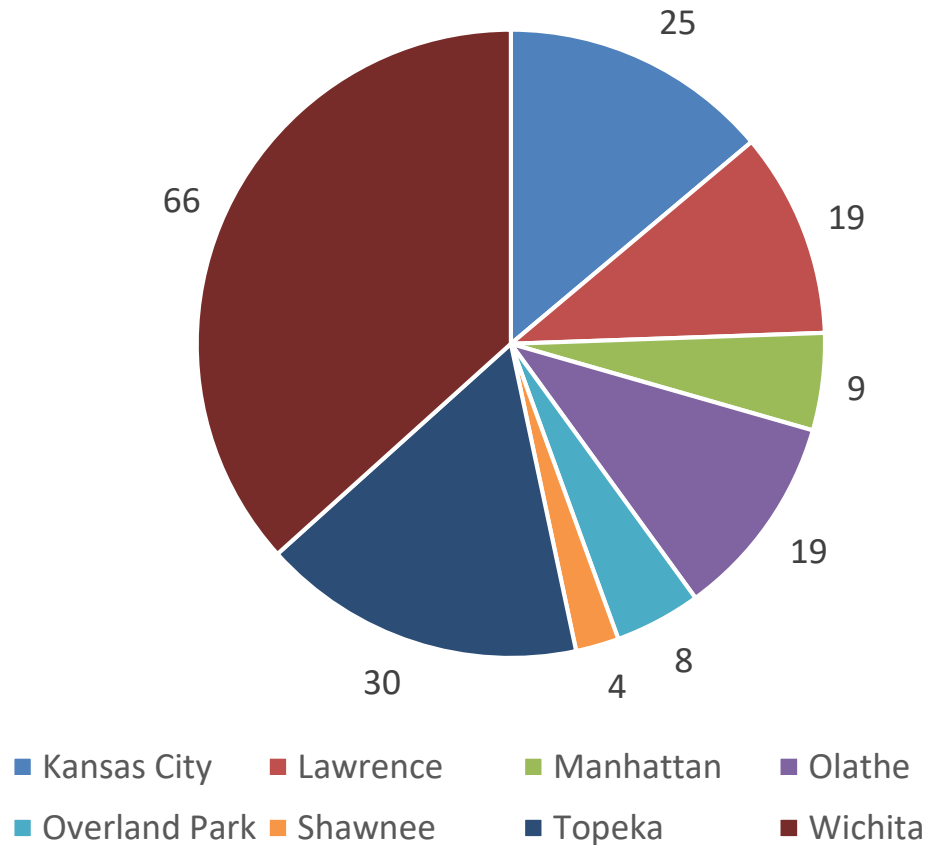


METHODOLOGY

Participants

- 2019 CACFP participating centers [8]
- 180 potential participants

Number of CACFP childcare centers by urban area



Data Collection: Phase One

- Qualtrics survey
 - 33 questions

The logo for Kansas State University, featuring the text "KANSAS STATE" in a large, serif font, with "UNIVERSITY" in a smaller, sans-serif font below it. The logo is set against a purple background with a faint, circular seal of the university in the background.

KANSAS STATE
UNIVERSITY

Instructions: Our specific interest is to learn more about how your center handles alternative meal needs and requests. Please have the staff member or director with the most knowledge about your alternative meal needs and requests complete the survey questions below.

This study is in no way related to the Child and Adult Care Food

Recruitment

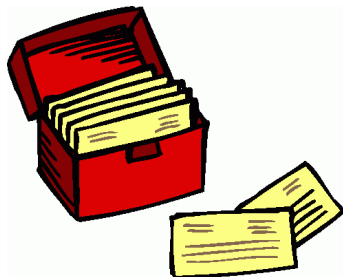
- Email with invitation to participate in the study
 - Follow-up
- Incentive for survey completion:
 - Comark PDT300 food thermometer



<https://www.walmart.com/ip/Comark-Instruments-PDT300-Waterproof-Pocket-Digital-Thermometer/101589276>

Data Collection: Phase Two

- Menu data collection
 - Identified in phase one
 - Unannounced calls
 - Reported what was served for each CACFP food component
 - Clarifying questions asked as necessary



<https://dundle.com/amazon/>

Healthy Eating Index – 2015

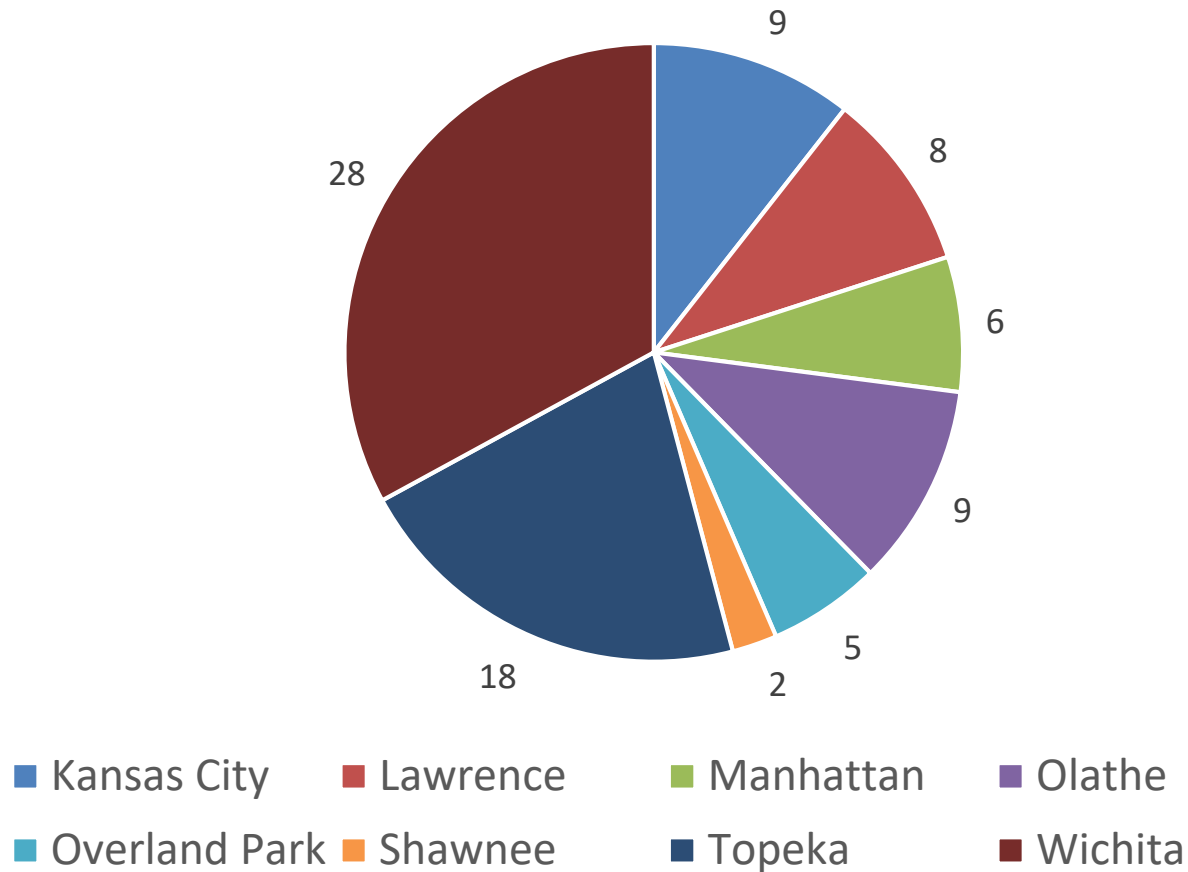
Component	Maximum points	Standard for maximum score	Standard for minimum score of zero
Adequacy:			
Total Fruits ¹	5	≥0.8 cup equiv. per 1,000 kcal	No Fruit
Whole Fruits ¹	5	≥0.4 cup equiv. per 1,000 kcal	No Whole Fruit
Total Vegetables ¹	5	≥1.1 cup equiv. per 1,000 kcal	No Vegetables
Greens and Beans ¹	5	≥0.2 cup equiv. per 1,000 kcal	No Dark Green Vegetables or Legumes
Whole Grains	10	≥1.5 oz equiv. per 1,000 kcal	No Whole Grains
Dairy ²	10	≥1.3 cup equiv. per 1,000 kcal	No Dairy
Total Protein Foods ¹	5	≥2.5 oz equiv. per 1,000 kcal	No Protein Foods
Seafood and Plant Proteins ²	5	≥0.8 oz equiv. per 1,000 kcal	No Seafood or Plant Proteins
Fatty Acids ³	10	(PUFAs + MUFAs)/SFAs ≥2.5	(PUFAs + MUFAs)/SFAs ≤1.2
Moderation:			
Refined Grains	10	≤1.8 oz equiv. per 1,000 kcal	≥4.3 oz equiv. per 1,000 kcal
Sodium	10	≤1.1 gram per 1,000 kcal	≥2.0 grams per 1,000 kcal
Added Sugars	10	≤6.5% of energy	≥26% of energy
Saturated Fats	10	≤8% of energy	≥16% of energy

Nutrient analysis

- Energy (kcal)
- Protein
- Carbohydrate
- Fat
- Saturated Fat
- Fiber
- Sodium
- Iron
- Potassium
- Calcium
- Vitamin A RAE
- Vitamin B12
- Folate DFE
- Zinc
- Choline

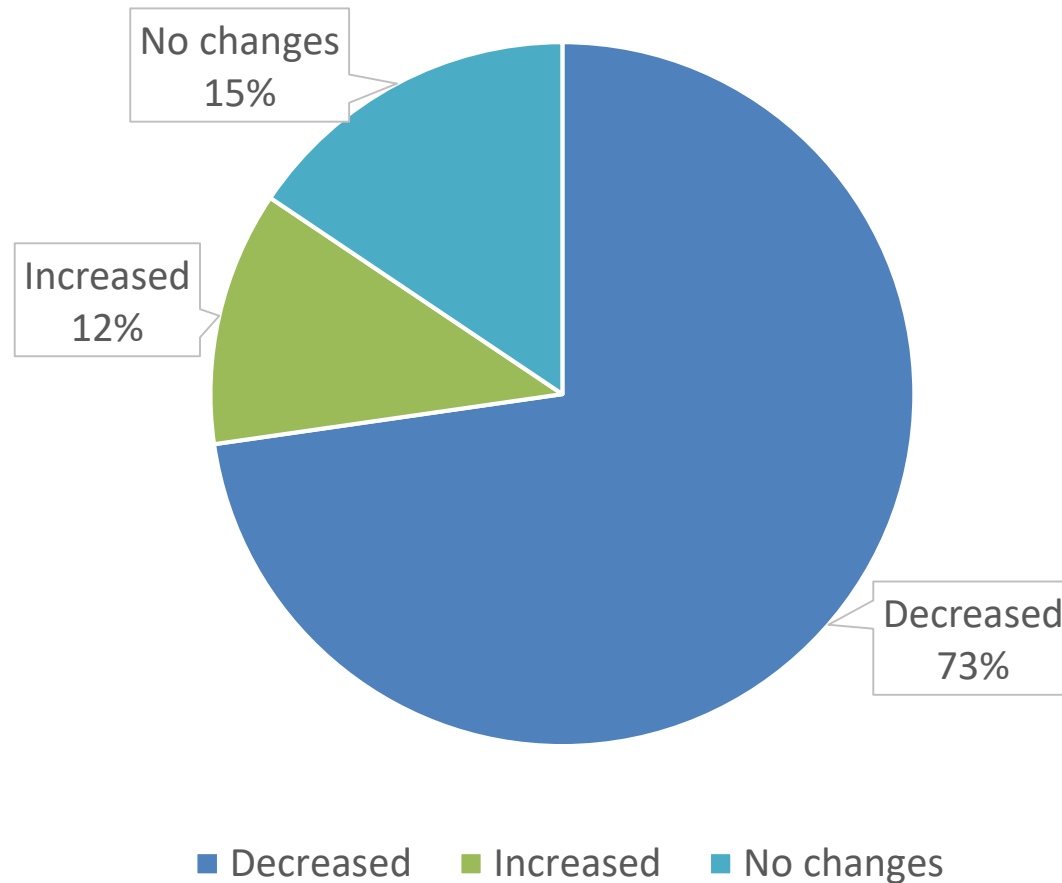
RESULTS

Survey Respondents



Impact of COVID-19

Enrollment changes



Impact of COVID-19 on Foodservice

- Three overarching themes were discovered:
 - Procurement challenges
 - Changes in meal service
 - Menu changes

COVID Impact Themes

Procurement challenges

“There is shortages of canned items and that did cause a bit of changes but overall, still similar”

“Limited supplies at the stores”

“Higher cost of food has caused menu changes.”

“It has become a lot harder to purchase foods.”

“Our owner has to go to 4-5 stores to purchase what we need & he has started buying non-perishables about 4 weeks ahead to have time to find the quantities we need.”

“Finding foods and milk that meet the requirements. Our food budget has increased due to price increases.”

COVID Impact Themes

Changes in meal service

“No self-serve, paper products simpler meals”

“The teachers have to plate all the meals as to do before COVID-19, we did family style dining.”

“We are no longer serving family style.”

“We have had to change from family style to having all meals prepackaged.”

“We are not serving family style right now and we are using a lot of disposable items. We are seating children and teachers 6 feet apart.”

COVID Impact Themes

Menu changes

“Temporarily, we followed a "rebound" menu after we reopened and have had to make adjustments as our food service distributor is out of things.”

“Menus adjusted to accommodate for items we cannot find”

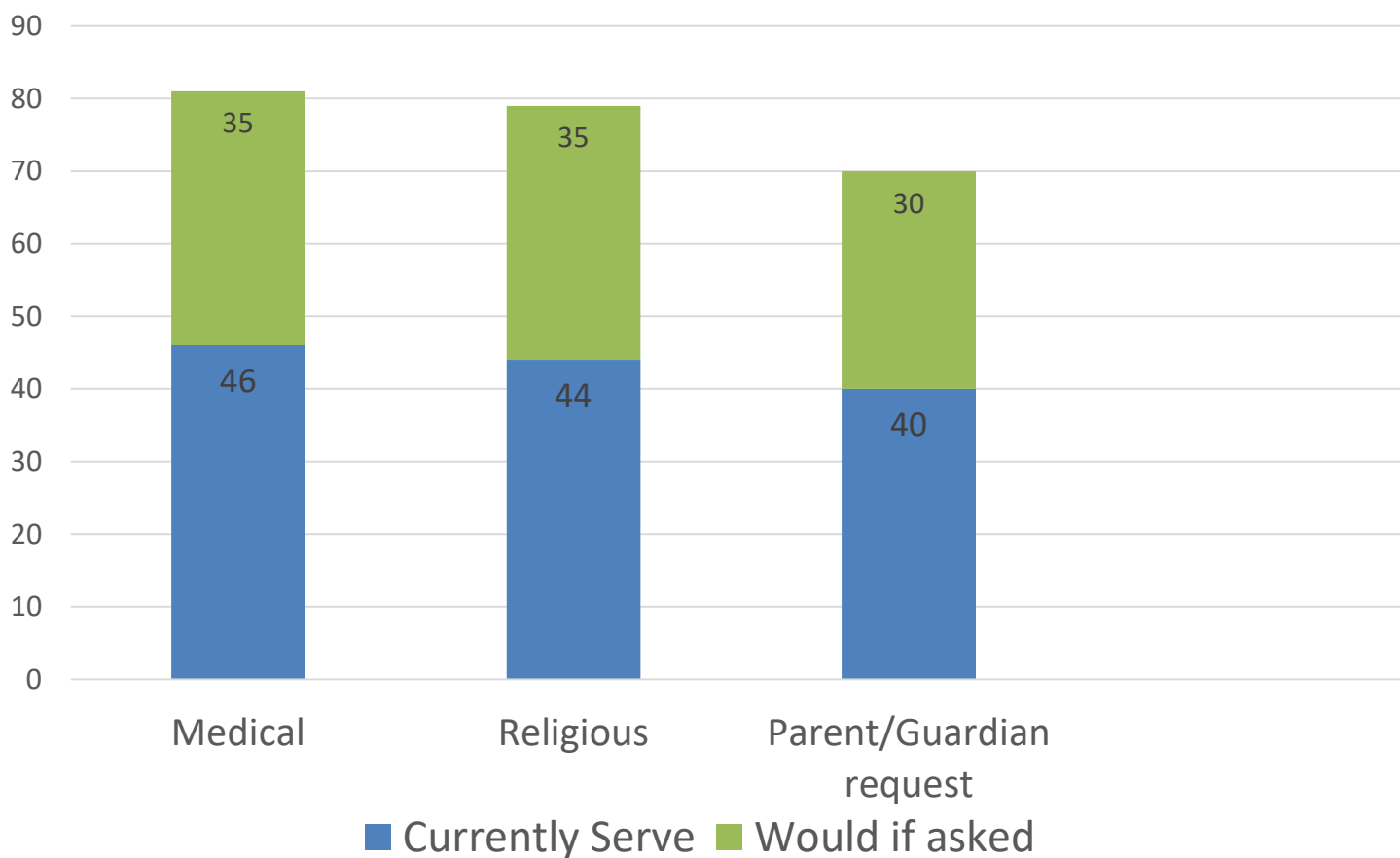
“Our menu has changed when there was a shortage on meats and other foods. Milk was also limited to a certain amount that could be purchased and we had to buy the types that was available.”

“We are utilizing a limited menu based on the small number of children we have and due to many items not being available at time of order...”

“...We used to have lunch catered as some of the facilities do in Topeka. We did drop that...”

“Some whole grain/whole wheat items have been unavailable, so we have had to adjust daily grain components.”

Frequency of reasons for accommodating vegetarian requests



Alternative menu needs and menu planning

- Center directors/administrators are most heavily involved
- Only 7% of centers (n = 6) had menus written by registered dietitians

Menu Analysis

- 27 days worth of menus
 - Seven centers
- Urban areas represented
 - Lawrence (3)
 - Topeka (2)
 - Olathe (1)
 - Overland Park (1)

Food Frequencies

Component	Food	Frequency
Meat	Poultry	14 (51.8%)
Meat Alternative	Cheese	17 (62.9%)
Fruit	Mandarin orange	6 (22.2%)
Vegetable	Corn	8 (29.6%)
Grain	Baked wheat product	14 (51.8%)

HEI-2015 Scores

	Range	Mean	t-test statistic	P
Standard menus	58.00 – 91.98	71.77	4.22	0.038
Vegetarian alternative menus	48.94 – 89.40	64.87		

Differences between menu types

Component	Maximum points	Standard for maximum score	Standard for minimum score of zero
Adequacy:			
Total Fruits ²	5	≥0.8 cup equiv. per 1,000 kcal	No Fruit
Whole Fruits ³	5	≥0.4 cup equiv. per 1,000 kcal	No Whole Fruit
Total Vegetables ⁴	5	≥1.1 cup equiv. per 1,000 kcal	No Vegetables
Greens and Beans ⁴	5	≥0.2 cup equiv. per 1,000 kcal	No Dark Green Vegetables or Legumes
Whole Grains	10	≥1.5 oz equiv. per 1,000 kcal	No Whole Grains
Dairy ⁵	10	≥1.3 cup equiv. per 1,000 kcal	No Dairy
Total Protein Foods ⁶	5	≥2.5 oz equiv. per 1,000 kcal	No Protein Foods
Seafood and Plant Proteins ^{7,8}	5	≥0.8 oz equiv. per 1,000 kcal	No Seafood or Plant Proteins
Fatty Acids ⁹	10	(PUFAs + MUFAs)/SFAs ≥2.5	(PUFAs + MUFAs)/SFAs ≤1.2
Moderation:			
Refined Grains	10	≤1.8 oz equiv. per 1,000 kcal	≥4.3 oz equiv. per 1,000 kcal
Sodium	10	≤1.1 gram per 1,000 kcal	≥2.0 grams per 1,000 kcal
Added Sugars	10	≤6.5% of energy	≥26% of energy
Saturated Fats	10	≤8% of energy	≥16% of energy

Trends of all menus


Component	Maximum points	Standard for maximum score	Standard for minimum score of zero
Adequacy:			
Total Fruits ²	5	≥0.8 cup equiv. per 1,000 kcal	No Fruit
Whole Fruits ³	5	≥0.4 cup equiv. per 1,000 kcal	No Whole Fruit
Total Vegetables ⁴	5	≥1.1 cup equiv. per 1,000 kcal	No Vegetables
Greens and Beans ⁴	5	≥0.2 cup equiv. per 1,000 kcal	No Dark Green Vegetables or Legumes
Whole Grains	10	≥1.5 oz equiv. per 1,000 kcal	No Whole Grains
Dairy ⁵	10	≥1.3 cup equiv. per 1,000 kcal	No Dairy
Total Protein Foods ⁶	5	≥2.5 oz equiv. per 1,000 kcal	No Protein Foods
Seafood and Plant Proteins ^{7,2}	5	≥0.8 oz equiv. per 1,000 kcal	No Seafood or Plant Proteins
Fatty Acids ⁸	10	(PUFAs + MUFAs)/SFAs ≥2.5	(PUFAs + MUFAs)/SFAs ≤1.2
Moderation:			
Refined Grains	10	≤1.8 oz equiv. per 1,000 kcal	≥4.3 oz equiv. per 1,000 kcal
Sodium	10	≤1.1 gram per 1,000 kcal	≥2.0 grams per 1,000 kcal
Added Sugars	10	≤6.5% of energy	≥26% of energy
Saturated Fats	10	≤8% of energy	≥16% of energy

Trends of all menus

Component	Maximum points	Standard for maximum score	Standard for minimum score of zero
Adequacy:			
Total Fruits ²	5	≥0.8 cup equiv. per 1,000 kcal	No Fruit
Whole Fruits ³	5	≥0.4 cup equiv. per 1,000 kcal	No Whole Fruit
Total Vegetables ⁴	5	≥1.1 cup equiv. per 1,000 kcal	No Vegetables
Greens and Beans ⁴	5	≥0.2 cup equiv. per 1,000 kcal	No Dark Green Vegetables or Legumes
Whole Grains	10	≥1.5 oz equiv. per 1,000 kcal	No Whole Grains
Dairy ⁵	10	≥1.3 cup equiv. per 1,000 kcal	No Dairy
Total Protein Foods ⁶	5	≥2.5 oz equiv. per 1,000 kcal	No Protein Foods
Seafood and Plant Proteins ^{7,2}	5	≥0.8 oz equiv. per 1,000 kcal	No Seafood or Plant Proteins
Fatty Acids ⁸	10	(PUFAs + MUFAs)/SFAs ≥2.5	(PUFAs + MUFAs)/SFAs ≤1.2
Moderation:			
Refined Grains	10	≤1.8 oz equiv. per 1,000 kcal	≥4.3 oz equiv. per 1,000 kcal
Sodium	10	≤1.1 gram per 1,000 kcal	≥2.0 grams per 1,000 kcal
Added Sugars	10	≤6.5% of energy	≥26% of energy
Saturated Fats	10	≤8% of energy	≥16% of energy

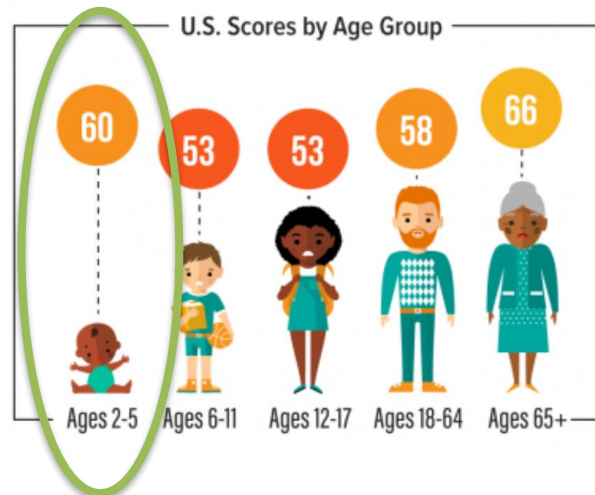
	Mean Micronutrient value (Range)		t-test statistic	p
Nutrient	Standard (n = 27)	Vegetarian alternative (n = 27)		
Energy (kcal)	295.57 (260.36-330.78)	328.82 (271.12-386.52)	-2.556	.014*
Protein (g)	20.46 (17.58-23.34)	18.81 (16.22-21.4)	2.216	.031*
Carbohydrate (g)	34.80 (27.96-41.64)	36.83 (28.61-45.05)	-.986	.329
Fat (g)	8.85 (6.39-11.26)	12.66 (6.9-18.42)	-3.154	.003*
Saturated Fat (g)	3.50 (2.54-4.46)	5.86 (3.22-8.5)	-4.357	.000*
Monounsaturated fatty acids (g)	2.83 (1.58-4.08)	3.93 (0.59-7.27)	-1.605	.115
Polyunsaturated fatty acids (g)	1.44 (0.34-2.54)	1.72 (0.56-2.88)	-.911	.366
Fiber (g)	3.63 (2.32-4.94)	4.35 (2.17-6.53)	-1.468	.148
Folate DFE (mcg)	57.26 (32.72-81.8)	70.19 (39.15-101.23)	-1.699	.095
Vitamin A RAE (mcg)	218.24 (117.6-318.88)	272.78 (172.32-373.24)	-1.993	.052
Calcium (mg)	333.11 (248.29-417.93)	555.66 (360.91-750.41)	-5.444	.000*
Vitamin B12 (mcg)	1.37 (0.99-1.75)	1.38 (1.03-1.73)	-.060	.952
Zinc (mg)	2.63 (1.71-3.55)	2.66 (2.2-3.12)	-.120	.905
Potassium (mg)	671.77 (582.65-760.89)	634.37 (504.5-764.24)	1.234	.223
Iron (mg)	1.80 (1.18-2.42)	1.72 (0.96-2.48)	.420	.676
Sodium (mg)	523.48 (323.86-723.10)	692.93 (470.61-915.25)	-2.947	.005*
Choline (mg)	82.88 (69.94-95.82)	65.9 (56.16-75.64)	5.446	.000*

CONCLUSIONS

- 
- Many centers are able or willing to accommodate vegetarian alternative meals
 - Limited confidence surrounding CACFP and vegetarian meal alternatives

HEI-2015 Scores

	Range	Mean
Standard menus	58.00 – 91.98	71.77
Vegetarian alternative menus	48.94 – 89.40	64.87

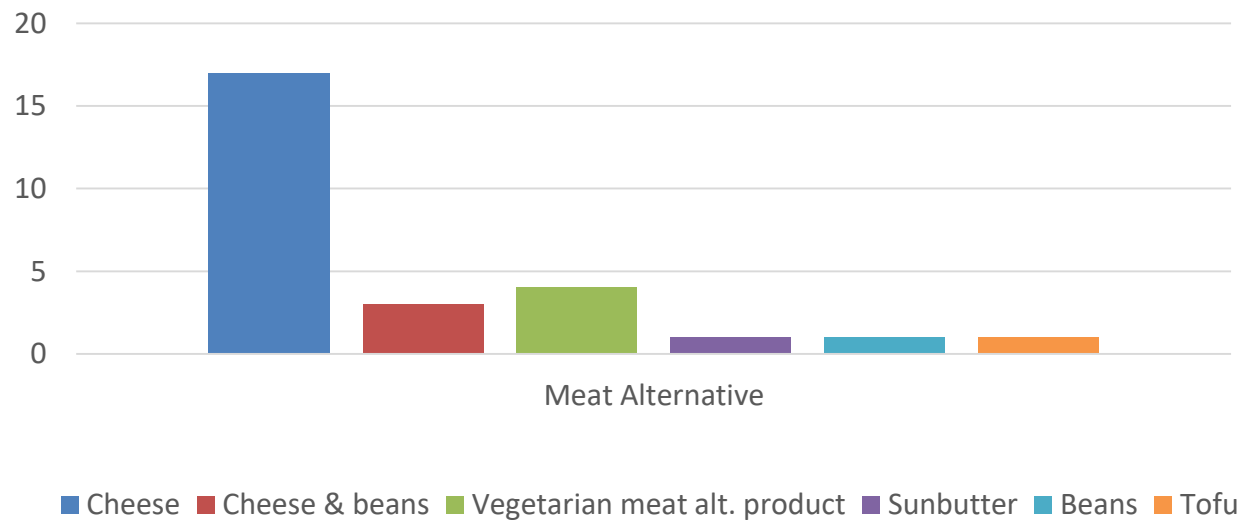



<https://www.fns.usda.gov/hei-scores-americans>

Component	Maximum points	Standard for maximum score	Standard for minimum score of zero
Adequacy:			
Total Fruits ¹	5	≥0.8 cup equiv. per 1,000 kcal	No Fruit
Whole Fruits ¹	5	≥0.4 cup equiv. per 1,000 kcal	No Whole Fruit
Total Vegetables ¹	5	≥1.1 cup equiv. per 1,000 kcal	No Vegetables
Greens and Beans ¹	5	≥0.2 cup equiv. per 1,000 kcal	No Dark Green Vegetables or Legumes
Whole Grains	10	≥1.5 oz equiv. per 1,000 kcal	No Whole Grains
Dairy ¹	10	≥1.3 cup equiv. per 1,000 kcal	No Dairy
Total Protein Foods ¹	5	≥2.5 oz equiv. per 1,000 kcal	No Protein Foods
Seafood and Plant Proteins ²	5	≥0.8 oz equiv. per 1,000 kcal	No Seafood or Plant Proteins
Fatty Acids ¹	10	(PUFAs + MUFAs)/SFAs ≥2.5	(PUFAs + MUFAs)/SFAs ≤1.2
Moderation:			
Refined Grains	10	≤1.8 oz equiv. per 1,000 kcal	≥4.3 oz equiv. per 1,000 kcal
Sodium	10	≤1.1 gram per 1,000 kcal	≥2.0 grams per 1,000 kcal
Added Sugars	10	≤6.5% of energy	≥26% of energy
Saturated Fats	10	≤8% of energy	≥16% of energy



Meat alternative frequencies



- 
- No significant difference in iron content between menu types
 - Vegetarian meals could be improved upon
 - less cheese
 - more plant-based alternatives

- Nutrition professionals could improve diet quality



<https://portalfield.com/news/life/160233>

Competencies - Thesis

Number and Competency		Description
2	Select quantitative and qualitative data collection methods appropriate for a given public health context.	Development of survey and menu data collection methods.
3	Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate.	<ul style="list-style-type: none">• Descriptive statistics• Thematic analysis• Student's t-tests ($P \leq .05$)• Confidence intervals (95%)
4	Interpret results of data analysis for public health research, policy or practice.	Discussion section of thesis.
15	Evaluate policies for their impact on public health and health equity.	Discussion section of thesis.
19	Communicate audience-appropriate public health content, both in writing and through oral presentation.	Writing thesis, thesis defense. Poster sessions with recorded audio for ASN and FNCE.

Competencies - APE

Number and Competency		Description
5	Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings.	Reviewed annual reports from four civilian public health agencies and created an annual report for 2019 for the Fort Riley Department of Public health.
9	Design a population-based policy, program, project or intervention.	Created 3 months worth of bulletin board and recipes for WIC clients.
18	Select communication strategies for different audiences and sectors.	Newspaper article on COVID-19 for Fort Riley community
21	Perform effectively on interprofessional teams.	I scheduled and held meetings with numerous DPH employees to create the annual report. Additionally, I took part in various meetings with IACH leadership and county health departments.
22	Apply systems thinking tools to a public health issue.	Decision flowchart for clinics within IACH system with patients suspected as COVID-19 PUI.

QUESTIONS

References

- 1 -World Health Organization. Early child development. (2019, October 7). Retrieved from <https://www.who.int/topics/early-child-development/en/>
- 2 – Corcoran, L., and Steinley, K. (2019). Early Childhood Program Participation, From the National Household Education Surveys Program of 2016 (NCES 2017-101.REV), National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.
- 3- Dietary Guidelines for Americans. (2015). *Dietary Guidelines 2015-2020*, eighth edition <https://health.gov/dietaryguidelines/2015/guidelines/executive-summary/>
- 4 -U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans, 2020-2025*. 9th Edition. December 2020. Available at [DietaryGuidelines.gov](https://www.dietaryguidelines.gov/).
- 5 - P.B.F.A. (2020, February 11). *U.S. Plant-Based Retail Market Worth \$4.5 Billion, Growing at 5X Total Food Sales*. Plant Based Foods Association. <https://www.plantbasedfoods.org/2019-data-plant-based-market/>
- 6 - Stahler, C. (n.d.). *How Many Adults in the U.S. are Vegetarian and Vegan | The Vegetarian Resource Group (VRG)*. The Vegetarian Resource Group. Retrieved April 9, 2020, from https://www.vrg.org/nutshell/Polls/2019_adults_veg.htm
- 7 – Governor Laura Kelly. (2020, March). *Executive order* (No. 20–16). State of Kansas. <https://governor.kansas.gov/wp-content/uploads/2020/03/EO20-16.pdf>
- 8 - Kansas Department of Education. (2019). *CACFP Centers 2019 Program Year*. https://datacentral.ksde.org/nutrition_reports.aspx

Average Healthy Eating Index-2015 Scores for Americans by Age Group, WWEIA/NHANES 2015-2016

Component	Maximum Points	Age Groups			
		All Americans (2+ years)	Children (2-17 years)	Adults (18-64 years)	Older Adults (65+ years)
Total HEI Score	100	58.7	53.9	58.3	64.0
Adequacy:					
Total Fruits	5	2.9	3.3	2.6	3.7
Whole Fruits	5	4.2	4.4	3.8	5.0
Total Vegetables	5	3.3	2.3	3.5	4.0
Greens and Beans	5	3.1	1.6	3.4	3.7
Whole Grains	10	3.0	3.3	2.7	4.0
Dairy	10	6.0	8.1	5.4	5.6
Total Protein Foods	5	5.0	4.7	5.0	5.0
Seafood and Plant Proteins	5	5.0	3.2	5.0	5.0
Fatty Acids	10	4.1	2.9	4.5	4.2
Moderation:					
Refined Grains	10	6.4	4.7	6.7	7.4
Sodium	10	3.7	4.4	3.4	4.0
Added Sugars	10	6.8	6.4	6.8	7.5
Saturated Fats	10	5.1	4.5	5.4	4.7



Standard menus					
Nutrient	Mean	SD	95% CI	3-year-olds' benchmark*	4-5-year-olds' benchmark**
Calories (kcal)	295.57	35.21	281.64-309.50	373.66-480.00	401.00-521.33
Protein (g)	20.46	2.88	19.32-37.5	4.9	5.44
Carbohydrate (g)	34.80	6.85	32.09-37.51	43	43
Fat (g)	8.85	2.46	7.88-9.83	12.45-21.33	11.14-20.27
Saturated Fat (g)	3.50	0.96	3.12-3.88	4.15-5.33	4.46-5.76
Fiber (g)	3.63	1.31	3.11-4.15	5.23-6.72	5.62-7.3
Folate DFE (mcg)	57.26	24.54	47.55-66.96	50	66
Vitamin A RAE (mcg)	218.24	100.64	178.43-258.05	100	132
Calcium (mg)	333.11	84.82	299.56-366.66	165	264
Vitamin B12 (mcg)	1.37	0.38	1.22-1.52	0.3	0.4
Zinc (mg)	2.63	0.92	2.27-3.00	1	1.65
Potassium (mg)	671.77	89.12	636.5-707.03	1,000	1,254
Iron (mg)	1.80	0.62	1.55-2.04	2.31	3.3
Sodium (mg)	523.48	199.62	444.51-602.48	333	396
Choline (mg)	82.88	12.94	77.76-88.00	66	82.5



Vegetarian Alternative Menu					
Nutrient	Mean	SD	95% CI	3-year-olds' reference*	4-5-year-olds' reference*
Calories (kcal)	328.82	57.70	305.99-351.64	373.66-480.00	401.00-521.33
Protein (g)	18.81	2.59	17.79-19.83	4.9	5.44
Carbohydrate (g)	36.83	8.22	33.58-40.08	43	43
Fat (g)	12.66	5.76	10.38-14.94	12.45-21.33	11.14-20.27
Saturated Fat (g)	5.86	2.64	4.81-6.90	4.15-5.33	4.46-5.76
Fiber (g)	4.35	2.18	3.49-5.21	5.23-6.72	5.62-7.3
Folate DFE (mcg)	70.19	31.04	57.91-82.47	50	66
Vitamin A RAE (mcg)	272.78	100.46	233.04-312.52	100	132
Calcium (mg)	555.660	194.75	478.62-632.70	165	264
Vitamin B12 (mcg)	1.38	0.35	1.24-1.52	0.3	0.4
Zinc (mg)	2.66	0.46	2.47-2.84	1	1.65
Potassium (mg)	634.37	129.87	583.00-685.74	1,000	1,254
Iron (mg)	1.72	0.76	1.42-2.02	2.31	3.3
Sodium (mg)	692.93	222.32	604.98-780.88	333	396
Choline (mg)	65.91	9.74	62.06-69.76	66	82.5

All menus

Exceeded 1/3:

- Protein
- Vitamin A
- Calcium
- Vitamin B12
- Zinc
- Sodium

Did not meet 1/3:

- Calories
- Iron
- Fiber
- Potassium