Nutritional characteristics and development factors of U.S. prison menus

by

Laura Bain

B.S., Brigham Young University, 2009
M.B.A., University of Utah, 2018

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Food, Nutrition, Dietetics and Health
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KANSAS STATE UNIVERSITY
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Abstract

Nutrition-related health disparities plague prisons in the United States. Taxpayers fund the rising healthcare costs for the incarcerated. Unregulated inadequate prison menus may contribute to non-communicable chronic health conditions in a vulnerable population. Correctional registered dietitian nutritionists (RDNs) support menu development in a variety of ways including advocating for nutritionally beneficial menu choices. The purpose of this exploratory research was to assess nutrition offerings provided by prison menus as well as gain insight on current factors influencing menu nutrition.

Research methods included a two-phase approach to data collection. Records requests to obtain master menus and associated nutrition analyses were submitted to all United States departments of corrections; a total of 33 states provided documents for analysis. Researchers found that prisons serve gendered menus to the general population, and 52.9% of gendered menus provide the same offerings to both males and females. Female overall nutrition needs are lower than males, therefore, 52.9% of gendered menus provide excess calories, and saturated fat to females. Sodium is served in excess to both males and females. Fruit and vegetable servings on all gendered menus fell short of the Dietary Guidelines for Americans recommendations. The average prison menu inappropriately estimates calories, macronutrients, sodium, and other micronutrients in a one-size-fits-all menu development method without considering gender, age, and physical activity.

A survey was developed and distributed to obtain correctional nutrition professional's perspective on factors influencing menu nutrition. Researchers attempted to contact dietitians in all departments of corrections as each department must contract RDN services for menu approval to achieve accreditation. In total, researchers invited 34 corrections nutrition professionals to

participate in and 24 completed the survey representing 20 state prison systems. Survey response data indicated that eight departments of corrections contract with outside RDNs who were less accessible to researchers. Menus approved by contract dietitians provided less fruit and vegetable servings. Nutrition guidelines recommend consuming no more than half of fruit servings as fruit juice; states whose menus served the highest proportion of fruit juice contracted for RDN services, all of which exceed guidelines. Eighteen states menus include a fortified beverage to supplement menu item nutrient offerings. Ten of the 18 states also contract for RDN services, and nine out of 10 contract menus including fortified beverages serve less than the recommended amount of fruit servings.

Findings from this research provide opportunities for further investigation into corrections menus. Nutrition offerings from prisons including fortified beverages and prison menus offered by contract services will provide additional insight on menu adequacy. Religious menus are offered to general prison populations and understudied. This work supports corrections-specific guideline development which will be supported by additional research in this vital area.

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Major Professor
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Dedication

This is dedicated to my mom and dad who could not be prouder that I actually did this.

Chapter 1 - Introduction

This chapter addresses the following: basic overview of the correctional foodservice system including a Registered Dietitian Nutritionist's (RDN) role; current nutrition practices in county, state, and federal facilities; statement of the problem; purpose and objectives; research questions; significance of this research project; and limitations. Definitions of selected terms are available near the end of this chapter.

Overview of the Correctional Foodservice System

Roughly 5,500,600 adults were housed in United States correctional facilities in 2020 (Kluckow & Zeng, 2022). The correctional foodservice system includes county jails, state prisons, federal prisons, and privately owned prisons housing state and federal incarcerated persons; this foodservice system impacts five million incarcerated persons annually with minimal regulation (Camplin, 2016). The overarching mission for correctional facilities in the United States is to rehabilitate the individuals in their care. Rehabilitation conceivably includes physical reconditioning. Each correctional system provides sustenance, medical care, and various other services during incarceration.

Menus and nutrition are integral to rehabilitation. The respective foodservice departments provide meals, and each facility organizes food and medical departments differently; system structure uniformity is uncommon. Generally, each foodservice department collaborates with an RDN to create a cycle menu that meets the entire incarcerated population's nutrition needs. This menu is the primary source of food and nutrition an incarcerated person receives during incarceration. The dearth of published research on foodservice systems in corrections leaves

correctional RDNs and other stakeholders under supported in efforts to improve nutritional offerings that prison menus provide.

The RDN's role varies across facilities. County jails contract with RDNs specifically to review the menu for nutritional adequacy. Some state and private prisons contract with foodservice companies employing full-time RDNs dedicated to corrections, such as Aramark (Aramark Correctional Facilities, 2022). Other states hire a part- or full-time RDN as part of a foodservice or medical department. In the foodservice department, an RDN may actively participate in menu planning. As part of a medical team, the RDN may primarily provide clinical services and advocate to the foodservice for menu changes.

Current Nutrition Practices in Corrections Facilities

Correctional facilities approach menu planning in a variety of ways. Jails often accommodate fewer special menu needs than prisons due to the shorter length of incarceration. Some states provide separate menus for males, females, age (adult vs. pediatric), and religious requirements. Prisons that provide one menu to accommodate all circumstances face scrutiny to meet specific nutrition needs for the variety of health conditions of each incarcerated person (Herbert et al., 2012). A generalized menu approach may not be adequate due to increasing litigation requiring facilities to provide reasonable accommodation to the individual incarcerated person's health needs. In addition, the Religious Land Use and Institutionalized Persons Act requires that prisons provide a diet consistent with various religious practices (United States Department of Justice, 2015). Addressing religious needs with a separate religious menu reduces religious restrictions to regular menus. Providing a variety of menus further complicates the inconsistent nutrition offerings between facilities.

Federal and State Prisons

Individuals who have violated federal laws and codes serve time in federal prisons; likewise, individuals violating state laws and codes serve time in state prisons. Those convicted of violating both federal and state laws are subject to serving time for each offense. Overcrowded state prisons contract with appropriate correctional facilities to house the incarcerated. Federal and state incarceration lengths are comparable.

Federal and state prison sentence lengths exceed shorter jail stays. In 2018, the average prison sentence length was 6.7 years. Incarcerated persons with murder convictions receive average sentences over 48 years, and rape convictions receive average sentences over 18 years. Drug convictions are much shorter ranging from 3.7-7.0 years (Kaeble, 2021). Prisons are intended for long-term housing which require rehabilitation, long-term medical care, and adequate nutrition offerings.

The Department of Justice (DOJ) funds Federal Bureau of Prisons (BOP) which manages federal prisons (Federal Bureau of Prisons, 2023). Alternately, state legislators annually approve state prison budgets from taxpayer funds. Food is among the largest expenses in a prison system, therefore, constantly scrutinized for ways to reduce costs (Camplin, 2016).

Balancing nutritional integrity and cost of prison menus requires vigilance as food commodities constantly change (Economic Research Service, 2023). The corrections sector has not developed best practices outlining effective menu development procedures that maximize cost or nutrition. Delineating appropriate job descriptions and roles may benefit menu development to support budgetary constraints with the costly foodservices. For example, an RDN may be best suited to make advantageous nutritional menu changes, but a purchasing agent

may be able to make the most effective cost-saving menu changes. These changes may be at odds without collaboration.

Correctional Nutrition Professionals

Dietitians are nationally accredited food and nutrition experts. The Academy of Nutrition and Dietetics is a professional organization which supports RDNs through research, education, and advocacy (Academy of Nutrition and Dietetic, 2022). The Academy defines an RDN as "an individual who has met current minimum academic requirements (Baccalaureate degree granted by a U.S. regionally accredited college or university, or foreign equivalent) with successful completion of both specified didactic education and supervised-practice experiences through programs accredited by The Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy, who has successfully completed the Registration Examination for Dietitians and remitted the annual registration fee. To maintain the Registered Dietitian (RD) or RDN credential, the RD or RDN must comply with the Professional Development Portfolio (PDP) recertification requirements (accrue 75 units of approved continuing professional education every five years)" (Academy of Nutrition and Dietetics, 2020). RDNs practice in a variety of industries with many nutrition specialties. As the industry expert on nutrition, RDNs are qualified to determine nutritional adequacy for various populations both institutionalized and non-institutionalized.

Correctional facilities work with an RDN to approve menus. No current research outlines which states employ RDNs or the employment status (eg. full-time, part-time, or contract). Each state determines the extent to which an RDN is involved in the menu process and approval. Correctional facilities accredited by the American Correctional Association (ACA) or the National Commission on Correctional Health Care (NCCHC) require RDNs to review menus

annually (California Department of Corrections and Rehabilitation, 2022; National Commission on Correctional Health Care, 2022). Accreditation is voluntary. However, overcrowded federal and state facilities contract with other prison systems, jails, or private prisons to house those in their jurisdiction; contract facilities must be ACA accredited (Federal Bureau of Prisons, 2022) therefore, contract facilities must have a menu approved by an RDN.

Accreditation

Accreditation is not required to receive federal funds or operate a prison. However, the incarcerated persons are litigious (Gunderson, 2022), and accreditation certifications are a countermeasure that Departments of Corrections use against claims made in lawsuit (ACA, 2022). Passing an accreditation survey allows the assumption that facilities operate ethically and appropriately. However, accrediting organization guidelines lack national nutrition standards for prison menus. Currently, two organizations offer accreditation for corrections facilities related to menu nutrition: ACA and NCCHC. These are private, non-governmental organizations.

American Correctional Association (ACA)

The ACA accreditation process requires an RDN to review the prison menus at least annually for nutritional adequacy; this standard is mandatory. The RDN uses professional discretion to determine the nutritional adequacy. The ACA (2014) suggests RDNs may use Dietary Reference Intakes (DRIs), Dietary Guidelines for Americans (DGAs), MyPlate.gov, therapeutic lifestyle change diet, or dietary approaches to stop hypertension as standards to meet American ACA menu review requirements. The ACA (2021) dietary guidelines require:

There is documentation that the institution's dietary allowances are reviewed at least annually by a qualified nutritionist or dietician to ensure that they meet the nationally recommended allowances for basic nutrition. Menu evaluations are conducted at least quarterly by institution food service supervisory staff to verify adherence to the established basic daily servings.

Comment: Dietary allowances, as adjusted for age, sex, and activity, should meet or exceed the recommended dietary allowances published by the National Academy of Sciences. A qualified nutritionist or dietician is a person registered or eligible for registration by the American Dietetic Association or who has the documented equivalent in education, training, or experience, with evidence of relevant continuing education (ACA, 2021, p. 146).

National Commission on Correctional Health Care (NCCHC)

Similarly, NCCHC addresses nutrition in two standards. In total, a facility must meet 63 standards; 100% of "essential" standards and 85% of "important" standards must be met for accreditation (NCCHC, 2022). The first standard titled "Healthy Lifestyle Promotion" suggests medical staff encourages incarcerated persons to practice healthy habits and addresses the master menu served to the general incarcerated population. This standard states "the facility provides a nutritionally adequate diet to the general population. An RDN, or other licensed qualified nutrition professional, as authorized by state scope of practice laws, documents a review of the regular diet for nutritional adequacy at least annually. The facility has a procedure in place to notify the RDN whenever the regular diet menu has changed" (NCCHC, 2022, p. 29). Healthy

Lifestyle Promotion is classified as important; the RDN's menu approval verifying nutritional adequacy is not required for a prison medical department to achieve NCCHC accreditation.

The "Medical Diets" standard states that "a registered dietitian nutritionist (RDN) or other licensed qualified nutrition professionals, as authorized by state scope of practice laws, documents a review of all medical diets for nutritional adequacy at least annually" (NCCHC, 2022). Medical diets in this standard are defined as "modified diets ordered for temporary or permanent health conditions; they modify the types, preparation, and/or amounts of food. Examples include diabetic/consistent carbohydrate, low sodium, low fat, celiac, renal, soft, liquid, pregnancy, and nutritional supplementation" (NCCHC, 2022, p.77). Note that medical diets are modifications to the master menu, which is developed to serve the general incarcerated population. The review must be signed by the RDN and include the date and title of the RDN. The Medical Diets standard is classified as essential, requiring the medical meals to provide adequate nutrition determined by the RDN.

Costs of Inadequate Nutrition

Food available to the incarcerated is primarily purchased from the commissary store or provided by prison foodservice. Commissary offerings are inconsistent with MyPlate recommendations (Rosenboom et al., 2018). Food options available in commissary stores provide calories and macronutrients in excess (Lopez et al, 2022). Rosenboom et. al (2018) also suggested incarcerated persons "could benefit from nationwide dietary research to inform policies that prioritize the availability of meals and food offerings that are consistent with the recommendations in the DGAs" (p. 271). Research suggests that prison menus also may not

provide adequate nutrition (Collins & Thompson, 2012; Cook et al., 2015; Holliday & Richardson, 2021).

Improper nutrition is a modifiable risk factor for many chronic conditions afflicting the incarcerated including obesity, hypertension, and diabetes. The Bureau of Justice Statistics reported in 2015 that 30.2% of the incarcerated in state prisons had hypertension, 9% had diabetes, and 45.7% of residents were overweight (Maruschak, 2015). Obesity alone costs the U.S. $173 billion per year (Division of Nutrition, Physical Activity, and Obesity, 2022). Hypertension costs $198 billion per year (Centers for Disease Control and Prevention, 2022c) and diabetes is the costliest to the U.S. health system at an estimated $327 billion annually (Centers for Disease Control and Prevention, 2022b). Healthcare costs covering the 5,500,600 incarcerated persons in state and federal prisons burdens taxpayers (Kluckow & Zeng, 2022). A report from the Pew Charitable Trusts estimated that departments of corrections spent $8.1 billion collectively on health care services in 2015 for the incarcerated (Huh et al., 2017). The federal prison population reports fewer chronic conditions than the non-institutionalized population; nutrition-related chronic health issues are more common in state prison populations (Wilper et al., 2009).

Increasing medical costs related to health conditions among the incarcerated are weighty concerns for dietitians and prison medical administrators (Goodwin et al., 2017). RDNs are professionally trained to promote health and assist in nutrition-related disease management (Occupational Employment and Wage Statistics, 2022). Long-term, overall expenses to improve menu nutrition may reduce medical costs by increasing incarcerated person's overall health (Collins & Thompson, 2012). However, adding fruits, vegetables, whole grains, and reducing processed foods may increase food costs. DOC departmentalization likely translates healthful

menu changes as a fiscal detriment to foodservices and budgetary benefit to medical departments.

Statement of Problem

Each state operates food services according to their needs, all separate from the Federal Bureau of Prisons. Because this decentralized food system is not accountable to national guidelines, inconsistency among correctional facilities may inadvertently permit nutritionally inadequate prison menus (Holliday & Richardson, 2021). An RDN commonly approves prison menus for nutritional adequacy; however, a formal national guideline detailing nutritional standards to validate menus is nonexistent.

Prison administrators speak the language of rules and regulations; recommendations and suggestions are open to interpretation. RDN recommendations advocating for menu improvements can be considered elective modifications. Concrete standards and regulations highlight clear discrepancies and reinforce nutritional recommendations. Because accreditation guidelines do not require specific nutrition standards, correctional RDNs apply general nutrition guidelines to balance general incarcerated population's needs, and administration, foodservice, and security staff demands. Although nutrition research and guidelines continually change to incorporate current nutrition research, prison menus seem to remain nutritionally static. The RDN bears the ethical responsibility to approve menus for nutritional adequacy with ambiguous application to dietary guidelines.

To develop clearer national prison nutrition standards, policymakers must understand current nutrition offerings. Prison administrators and lawmakers cannot support improved prison nutrition without understanding current practices. Although two studies on county jails review

correctional nutrition (Collins and Thompson, 2012; Cook et al., 2015), only one published article representing 12 of the 50 states reviews prison menus (Holliday and Richardson, 2021). Additional and more comprehensive research is essential to understand current prison nutrition offerings.

Purpose

The purpose of this research was to assess nutrition offerings provided by prison menus. Factors influencing menus, RDNs, and organizational influences on nutrition offerings were also be investigated.

Objectives

The objectives of this research were to:

1. Describe current nutrition offerings in U.S. prison menus.
2. Determine factors related to menu and nutrition decisions.
3. Provide recommendations for further research.
4. Provide recommendations on prison nutrition for stakeholders.

Research Questions

The research questions of this study were:

1. What is the current state of prison menus nutritionally?
2. How does the RDN's role relate to the menu?
3. What is the relationship between corrections' organizational factors and nutrition offerings?

Collecting and reviewing current prison menus and associated menu analyses provided an inclusive evaluation of the current state of prison nutrition offerings. This research was the first to comprehensively review U.S. prison menus and describe baseline nutrition offerings, thus guiding further analysis and research. Understanding current menu practices may reinforce positive trends and identify areas for improvement.

All state prison systems depend on professional menu approval, most likely by an RDN. How each state interacts with the RDN varies. One state may require full-time RDN assistance for menu development, and another state may employ an RDN for clinical services and request menu advocacy when interacting with foodservice personnel. Corrections RDN job descriptions may suggest a type of menu relationship, but reality may dictate another. Although there is not a correct way for the RDN to engage with the menu, different relationships may suggest superior menu offerings.

Many organizational factors relate to prison nutrition offerings. The organizational delineation or chain-of-command employing an RDN may create inherent barriers to menu development and approval, thus influencing nutrition offerings. For example, an RDN working in a medical department may not naturally be involved with menu development taking place in a foodservice department thus leading to more of a menu advocate role. Advocacy can be a powerful tool, or downplayed when the organizational culture prioritizes budgetary, personnel, or security when considering menu changes.

Cost is a major organizational factor that controls menu decisions in many foodservice establishments. Some legislatures may approve annual corrections budgets sometimes as a line item included in overall state spending; menu improvements may not typically be a discussion

point when negotiating high-level budget allocations. Menu costs vary from system to system as menu funding is also distributed differently in each system. For example, employee salaries and food costs may draw from the same foodservices budget. No matter how budgets are managed, the cost of foodservice is heavily scrutinized and monitored.

Significance of Research

This research will serve as the basis for current discussion and future research on the prison foodservice system. The findings from this research provide a baseline for change to which corrections RDNs, prison administrations, and other stakeholders should refer. Subsequent research is needed to build on information and ideas in this report. Research supports policy development. Uniform national policies defining appropriate and adequate nutrition on prison menus validates the RDNs advocacy for menu improvements. Accreditation standards clarifying nutritional adequacy by adopting such nutrition policies will reduce ambiguity and reinforce uniformity. Byproducts of the anticipated prison menu improvements related to policy changes may also reduce medical cost and reinforce the correctional industry mission to rehabilitate.

A statement published by NCCHC in February 2023 on nutritional wellness states that food and nutrition are fundamental rights during incarceration. This statement endorses "the urgent need for high-quality research to assess the impact of nutrition quality on the health and behavior of people while they are in custody" (NCCHC, 2023). Although NCCHC states that diets should be nutritionally adequate based on "nationally recognized nutrition standards," (NCCHC, 2023, p. 2), nutrition standards are not specified. This research supports NCCHC's call to assess the impact nutrition quality provided during incarceration.

Definition of Terms

Registered Dietitian Nutritionist (RDN): "food and nutrition experts who have met the following criteria to earn the RDN credential: completed a minimum of a bachelor's degree, completed an ACEND-accredited (Accreditation Council for Education in Nutrition and Dietetics) supervised practice program, passed a national examination, and completed continuing professional education requirements" (Academy of Nutrition and Dietetics, n.d., *What Is a Registered Dietitian Nutritionist*). The U.S. Bureau of Labor Statistics notes that RDNs "plan and conduct food service or nutritional programs to assist in the promotion of health and control of disease. May supervise activities of a department providing quality food services, counsel individuals, or conduct nutritional research" (Occupational and Wage Statistics, 2022, *Dietitians and Nutritionists*).

Nutrition Offerings: Food and beverage items served to provide nutrition. The menu outlines specific meal items and components, and the menu is repeated cyclically. A 4-week cycle menu is common in correctional facilities. The correctional facility issues food trays to the entire prison population. Commissary is a store offered to incarcerated persons in some prisons; nutrition offerings do not include commissary items.

Master Menu: Served to the general population. May be developed to meet some demographic characteristic such as gender (male vs. female), age (pediatric vs. adult), or religion. Not to include medical diets which are alterations to the master menu to meet a specific medical condition such as diabetes, mechanical soft, hypertension, reflux, or calorie-controlled.

Incarcerated Person: Persons "confined in long-term facilities run by the state or federal government or private agencies. They are typically felons who have received a sentence of incarceration of 1 year or more. (Sentence length may vary by state because a few states have

one integrated prison system in which both prison and jail [individuals] are confined in the same types of facilities.)" (Bureau of Justice Statistics, 2021, "Glossary"). First-person language suggests referring to this population as "person/people/individuals experiencing incarceration, incarcerated person/people/individuals, or the incarcerated" (NCCHC, 2021, p. 1). Resident is also used to refer to individuals housed in prisons.

Jail: "A confinement facility generally operated under the authority of a sheriff, police chief, or county or city administrator. A small number of jails are privately operated. Regional jails include two or more jail jurisdictions with a formal agreement to operate a jail facility. Facilities include jails, detention centers, county or city correctional centers, special jail facilities (such as medical or treatment centers and pre-release centers), and temporary holding or lockup facilities that are part of the jail's combined function. Jails are intended for adults but can hold juveniles before or after their cases are adjudicated" (Bureau of Justice Statistics, 2021, "Glossary").

Prison: "Compared to jail facilities, prisons are longer-term facilities owned by a state or by the federal government. Prisons typically hold felons and persons with sentences of more than a year; however, the sentence length may vary by state. Six states (Connecticut, Rhode Island, Vermont, Delaware, Alaska, and Hawaii) have an integrated correctional system that combines jails and prisons. There are a small number of private prisons, which are facilities run by private prison corporations whose services and beds are contracted out by state or federal governments" (Bureau of Justice Statistics, 2021, "Glossary").

American Correctional Association (ACA): "the only national accreditation agency recognized worldwide for accreditation standards in the correctional industry. Founded in 1870, ACA is the oldest, largest, and most prestigious correctional organization in the world. ACA is a professional organization which focuses exclusively on the field of corrections, whose activities

include the administration of a nationally recognized accreditation program for all components of adult corrections. ACA has developed national standards which address services, programs, and other operations essential to effective correctional management. Accreditation provides systemic standardization of many critical operations and promotes sound public policy which will enable staff at all levels to be part of a nation-wide network of professionals with enhanced productivity, efficiency, and effectiveness" (California Department of Corrections and Rehabilitation, 2022)

National Commission on Correctional Health Care (NCCHC): A non-profit, non-government entity seeking to uphold standards of health care in correctional facilities. "The mission of the National Commission on Correctional Health Care is to improve the quality of health care in jails, prisons and juvenile confinement facilities. NCCHC establishes standards for health services in correctional facilities, operates a voluntary accreditation program for institutions that meet those standards, produces resource publications, conducts educational conferences and offers certification for correctional health professionals. NCCHC is supported by the major national organizations representing the fields of health, mental health, law and corrections" (National Institute of Corrections, 2021, "National Commission on Correctional Health Care").

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Chapter 2 - Review of Literature

This chapter will examine current research relevant to correctional nutrition professionals, the correctional foodservice system and nutrition offerings therein, health implications related to menu nutritional content, and potential healthcare costs correlated with nutrition-related health disparities in the correctional foodservice system. Although jails were not included in this study, relevant research on county jails was included given the potential applicability of the methods and findings from those studies. Research on correctional nutrition has been conducted globally, however, the United States (US) correctional system relies on national research and legislation, not outside system models and influences. For this reason, international correctional studies were not included.

In 2015, the U.S. housed the largest incarcerated population worldwide at over 2.2 million persons, more than China at 1.65 million (Walmsley, 2015). Almost one fifth of the total incarcerated individuals worldwide are housed in U.S. correctional facilities. In 2019, the U.S. operated 1,079 correctional facilities and 82 private facilities (Maruschak & Buehler, 2019). About 82% of incarcerated adults are housed in state facilities, 11% in federal facilities, and 7% in private facilities. Undoubtedly, prisons are requisite to the U.S. ecosystem.

Nutrition Offerings in Correctional Facilities

County Facilities

Jails temporarily house the incarcerated waiting for court action (65%) or sentence from a conviction (35%). The average expected length of stay for the transient jail population is less than 36 days (Zeng & Minton, 2021). The U.S. Department of Justice defines jail as “a confinement facility usually administered by a local law enforcement agency, intended for adults

but sometimes also containing juveniles, that holds persons detained pending adjudication and/or persons committed after adjudication for sentences usually a year or less" (United States Department of Justice, 2022, p. 5). This type of correctional facility is intended for short-term housing.

Due to the shorter length of stay, the risk of developing diet-related health issues during jail incarceration is less probable compared to prisons. No current research estimates malnutrition in relationship to jail nutritional offerings. County jails housing incarcerated persons for federal or state prisons receive routine audits ensuring adherence to federal and state regulations. Nutrition standards in county jails depend on local legislation if available. Jails may contract with an RDN to review menus for nutritional adequacy but follow-up ensuring recommendation implementation is not required or enforced.

Collins and Thompson (2012) compared a county jail in South Carolina against the South Carolina Department of Corrections menu nutritional analysis (Collins & Thompson, 2012). Their findings revealed that the county jail did not offer sufficient fiber, magnesium, potassium, vitamin D, and vitamin E. The jail's menu also provided excessive cholesterol, sodium, and sugar. This article noted the inexpensive cost of feeding the incarcerated at $1.13/day/person. This menu stands in need of nutrition improvements to avoid exacerbating nutrition-related health issues. Recommendations included increasing whole grains, whole fruit, and whole vegetables.

A Georgia county jail menu review revealed inadequate nutrition offerings when compared to the U.S. Department of Agriculture's MyPlate (U.S. Department of Agriculture, 2021), Dietary Reference Intake (DRI), and the Acceptable Macronutrient Distribution Ranges (Institute of Medicine 2005, 2005). The researchers found that the menu provided cholesterol,

saturated fat, and sodium in excess and lacked fiber, calcium, magnesium, potassium, and vitamins A, D, and E. The menu undersupplied whole grains, fruits and vegetables as well (Cook et al., 2015). The authors recommended providing separate menus for males and females. Other recommendations included incorporating whole grains, beans and legumes, increasing fruit and vegetables servings, vegetarian entrees, and reducing processed foods such as cakes and cookies.

These two studies assessing county jails recommend manageable changes for smaller foodservice systems. County jails house fewer high-risk incarcerated persons and lengths of stay are shorter than prisons. State and federal prisons indefinitely house the highest risk incarcerated persons, their menus often serve multiple facilities with larger, more volatile populations. Due to the nuanced situation of larger state prison systems, county jail recommendations may require additional considerations for implementation in a prison system.

Both county jail studies recommend increasing fruit and vegetable offerings which may pose security threats. The incarcerated brew illicit alcohol with fresh fruit (Spalding Walters et al., 2015). Security staff resists increasing fruit offerings due to increased incarcerated-staff altercations with intoxicated incarcerated persons. Vegetables are misused differently such as was the case when a few incarcerated individuals misused baked potatoes and likely caused a botulism outbreak in Utah's Department of Corrections (DOC) in 2011 (Thurston et al., 2012). Although fruits and vegetables are necessary, security staff consideration of menu changes can be beneficial when facility security is involved.

Incarcerated populations may be inclined to riot when prisons make unfavorable changes (Useem & Goldstone, 2002). Recommendations from the county jail studies may be considered unfavorable to this population. For example, incarcerated persons may view removing or decreasing the number of desserts, replacing white rice with brown rice, and removing chips and

other convenience items as unfavorable. Careful planning and communication within corrections facilities can mitigate these issues. Possibly posting proposed menus in dorms and allowing the incarcerated to air grievances before an update menu is implemented may enhance menu approval and decrease security threats. These suggestions may be more readily adopted in jails feeding fewer high security incarcerated individuals than in a larger system.

While the results of county jail menu reviews provide a baseline for corrections facility nutrition offerings, a review of state prisons is most applicable for this study. Because state and federal facilities house incarcerated adults long-term, an inadequate menu potentially causes nutritional deficiencies and malnutrition at a higher rate than county jails. The county jail studies establish a need for correctional menu changes and further research nutrition offerings at prisons.

Prison Facilities

Holliday and Richardson (2021) reviewed menus from seven state DOCs in the Midwest. Their analysis differentiated between gendered and religious menus. Surprisingly, Illinois did not provide a nutrition analysis because the dietitian was not aware an analysis was required for menu approval. Findings from the DOC menus resembled county jail findings. Menus offered daily calories, saturated fat, and sodium in excess. Holliday and Richardson (2021) found insufficient fruit vegetable offerings, see Table 2.3 for prison menu fruit and vegetable offerings.

Insert Table 2.1

Micronutrients were underreported, possibly explaining the deficient findings from the county jail articles. Menus adequately offer fruit at or above the guidelines. Holliday and Richardson (2021) provided a realistic and practical recommendation for prison facilities: a call to develop national standards.

Menu Requirements

The ACA accreditation process requires an RDN to review the prison menu at least annually for nutritional adequacy; this standard is mandatory. The RDN uses professional discretion to determine the nutritional adequacy. The ACA (2014) suggest RDNs may use Dietary Reference Intakes (DRIs), Dietary Guidelines for Americans (DGAs), MyPlate.gov, therapeutic lifestyle change diet, or dietary approaches to stop hypertension as standards to meet ACA menu review requirements. ACA (2021) dietary guidelines require:

> There is documentation that the institution's dietary allowances are reviewed at least annually by a qualified nutritionist or dietician to ensure that they meet the nationally recommended allowances for basic nutrition. Menu evaluations are conducted at least quarterly by institution food service supervisory staff to verify adherence to the established basic daily servings.
>
> Comment: Dietary allowances, as adjusted for age, sex, and activity, should meet or exceed the recommended dietary allowances published by the National Academy of Sciences. A qualified nutritionist or dietician is a person registered or eligible for registration by the American Dietetic Association or who has the documented equivalent in education, training, or experience, with evidence of relevant continuing education (p. 146).

Similarly, NCCHC addresses nutrition in two standards (NCCHC, 2022). In total, a facility must meet 63 standards; 100% of "essential" standards and 85% of "important" standards must be met for accreditation. The first standard titled "Healthy Lifestyle Promotion" suggests medical staff encourages the incarcerated to practice healthy habits and addresses the master menu served to the general population. This standard states that "the facility provides a nutritionally adequate diet to the general population. A registered dietitian nutritionist (RDN), or other licensed qualified nutrition professional, as authorized by state scope of practice laws, documents a review of the regular diet for nutritional adequacy at least annually. The facility has a procedure in place to notify the RDN whenever the regular diet menu has changed" (NCCHC, 2022). Healthy Lifestyle Promotion is classified as important; the RDN's menu approval verifying nutritional adequacy is not required for a prison medical department to achieve NCCHC accreditation.

The "Medical Diets" standard states that "a registered dietitian nutritionist (RDN) or other licensed qualified nutrition professionals, as authorized by state scope of practice laws, documents a review of all medical diets for nutritional adequacy at least annually (NCCHC, 2022)." Medical diets in this standard are defined as "modified diets ordered for temporary or permanent health conditions; they modify the types, preparation, and/or amounts of food. Examples include diabetic/consistent carbohydrate, low sodium, low fat, celiac, renal, soft, liquid, pregnancy, and nutritional supplementation" (NCCHC, 2022). Note that medical diets are modifications to the master menu, which is developed to serve the general incarcerated population. The review must be signed by the RDN and include the date and title of the RDN. The Medical Diets standard is classified as essential, requiring the medical meals to provide adequate nutrition determined by the RDN.

Religious Requirements

The Religious Land Use and Institutionalized Persons Act requires correctional facilities to accommodate religious observations and not "place arbitrary or unnecessary restrictions on religious practice" (United States Department of Justice, 2015). This legislation impacts prison menus by requiring accommodation for religious dietary observances. Some Judaism and Islamic followers strictly avoid pork for religious reasons (Vered, 2010). Halal food labeling indicates appropriate animal handling practices according to Islamic Law (Food and Agriculture Organization of the United Nations, 1997). Jewish dietary law requires Kosher food manufacturing preparation practices for meat, poultry, fish, dairy products, and other baked goods (Orthodox Union, 2022). Muslims observe Ramadan during which food and water are restricted from dawn to sunset (Elnakib, 2022).

Some facilities provide a separate menu for religious meals. Georgia and Florida offer a vegan menu (Florida Department of Corrections, 2022; Georgia Correctional Industries - Food and Farm Services, 2020). South Carolina jails removed pork from the menu altogether (Collins & Thompson, 2012). Utah provides Halal and Kosher meals upon religious verification and a voluntary vegetarian for other religious accommodations (Utah Department of Corrections, 2022). Of 12 Midwestern states studied, five provided menus specifically labeled religious (Holliday & Richardson, 2021). Each state addresses religious requirements differently, and each must adhere to circuit court decisions regarding the Religious Land Use and Institutionalized Persons Act in their area.

Current Menu Trends

Commonly, prisons offer plant-based menus for religious observances. Twelve prison systems also allow the general population to participate in plant-based meals programs (Rodriguez & Holliday, 2022). Federal prisons provide plant-based breakfast meals and allow the incarcerated to choose plant-based or omnivorous meals for lunch and dinner. The incarcerated population's health will benefit from prisons making vegetarian meals more accessible. Vegetarian diet patterns are correlated with lower risk of heart disease, type 2 diabetes, and obesity (Parker & Vadiveloo, 2019). Dietitians recommend consuming a vegetarian diet to promote health and reduce chronic disease (Melina et al., 2016).

Chronic Health Condition Risk Factors

The most recent publication from the Bureau of Justice Statistics reports health issues among the incarcerated from 2011-2012 (Maruschak, 2015). About 74% of state and federal incarcerated adults were overweight, obese, or morbidly obese. Over 43% of state and federal prisoners report having a chronic condition, and 66% of which take prescription medications. State and federal incarcerated persons most commonly report having high blood pressure/hypertension which represents 30.2% of chronic conditions. About 9% report diabetes/high blood sugar, 9% report heart-related problems, 6.1% report kidney-related problems, 1.8% report liver cirrhosis, and 3.5% have or report having had cancer. More females (62.9%) than males (49.6) report having a chronic condition. Prison populations are aging, and chronic conditions afflict 72.6% of incarcerated adults over 50.

State and federal incarcerated persons are more likely to have chronic health conditions than similarly-aged individuals in the non-institutionalized general population (Bai et al., 2015;

Harzke & Pruitt, 2018). Hypertension, diabetes, overweight, obesity, myocardial infarction, and cardiovascular disease are more common in state prisons than in the general population (Binswanger et al., 2009; Wilper et al., 2009). Chronic conditions require frequent doctor and specialist visits and often necessitate medications to maintain health. See Table 2.1 for a comparison of health condition prevalence between the general population and incarcerated population.

Insert Table 2.1 – see end of chapter

Lifestyles of the incarcerated are generally unhealthy (Gebremariam et al., 2018). Limited exercise equipment and sporting facilities suggest prison environments are not conducive to regular exercise and provide meager opportunities for physical activity. This reduction of physical activity in prisons lowers caloric and nutrition requirements for the incarcerated more so than the general U.S. population. Withdrawal from addictive substances unavailable in prison can correlate with weight gain when food placates the addiction. Prison is an inherently stressful environment, and incarcerated females are reported to cope with stress with comfort eating. Frequent lockdowns due to correctional staff shortages reduce recreation time and therefore physical activity. These unhealthy patterns increase risk of obesity and weight-related health issues.

Race

In 2021, the CDC reported that many chronic conditions are more common among Black and Latino Americans than White Americans (National Center for Health Statistics, 2021). These individuals are also incarcerated at a higher rate than Non-Hispanic White Americans (Wilper et al., 2009). Nutrition-related chronic health conditions are more common in state prison populations than the general non-institutionalized population as shown in Table 2.1. About 44.0% of state institutionalized individuals have been diagnosed with obesity as opposed to 37.0% of the non-institutionalized population.

Incarcerated adults have higher rates of hypertension, diabetes, and heart attack than non-institutionalized adults. Hypertension is even more common among incarcerated non-Hispanic white than incarcerated Hispanics (Binswanger et al., 2009). This is counterintuitive considering hypertension is more prevalent in Hispanics in the general U.S. population (National Center for Health Statistics, 2021). Black adults make up 39% of the prison population and Hispanic adults make up 19% of the prison population (Maruschak & Buehler, 2019). Higher obesity, hypertension, diabetes, and heart attack rates for incarcerated Black and Hispanic adults is problematic in prisons because Black and Hispanic adults are also incarcerated at a higher rate.

Age

Persons 65 years and older are conventionally considered older or aging adults. However, the unhealthy lifestyle and poor medical care during incarceration can exacerbate and promote chronic conditions usually caused by aging; therefore, prison classification for old age starts at 50-55 years old for medical and nutritional purposes (Skarupski et al., 2018). Over 10% of the

state prison populations are 55 years old and older (Widra, 2020). The BOP defines aging as 50 years and older (Office of the Insepctor General, 2020).

Although the COVID-19 pandemic motivated a compassionate (early) release to many elderly adults, the older incarcerated population is the fastest growing prison demographic (Skarupski et al., 2018). Long prison sentences ensure that this demographic continues to grow. The aging prison population is plagued with hypertension, diabetes, obesity, cardiovascular disease, and a history of heart attack more so than younger counterparts (Binswanger et al., 2009). The growing aging incarcerated population correlates with an increase in medical costs.

Gender

Much of the nutrition research among the incarcerated focuses on females who are more likely to be overweight and obese than incarcerated males (Herbert et al., 2012). Of the 12 states included in the Holliday and Richardson (2021) article, only six states provided menus specifically for females. Females receiving food from menus designed for men yields inappropriate overfeeding, which increases health risks common among females during incarceration. Gender is associated with an increased prevalence of non-communicable diseases during incarceration. “Although women had a similar or lower prevalence of each condition than men in the non-institutionalized population, they had a higher prevalence than men in jails and prisons” (Binswanger et al., 2009). Other factors may also influence risk for these non-communicable diseases such as age, race, socioeconomic indicators, education, alcohol consumption, etc.

Weight gain is a pervasive issue among the incarcerated. A study of women in the Rhode Island correctional system indicated that 71% of women awaiting trial gained weight at about

1.1lbs per week with the most significant gains occurring during the first two weeks of incarceration (Clarke & Waring, 2012). About 42% of this group self-reported having a condition that limited the ability to exercise, therefore increasing risk of weight gain. In another study, females gained an average of 5.34lbs compared to 0.67lbs that males gain during an average incarceration of 752.6 days. Incarcerated females with a history of diabetes and hypertension did not significantly gain as much weight (Gates & Bradford, 2015). This is likely because their medical conditions were disclosed during intake exams and nurses establish follow up care. Three possible factors leading to weight gain are high stress levels, depression, and lack of physical activity, each also being a risk factor for non-communicable diseases (Clarke & Waring, 2012). Although incarcerated females tend to gain weight, a longitudinal study found no statistical difference in weight gain between incarcerated white and African American persons (Gates & Bradford, 2015).

Persistent overfeeding correlates with poor blood sugar control. Firth et al. (2015) studied incarcerated females in an Oregon county jail whose regular menu provided 3,000 kcal/day. The intervention reduced calories to 2,200 kcal/day and provided nutrition education for 90 days. Females exposed to the intervention improved hemoglobin A1c by 0.04% where the control group improved hemoglobin A1c by 0.01%, a statistically significant finding. In addition to improving caloric intake, this study includes nutrition education intervention (Firth et al., 2015). County jails house fewer incarcerated persons than prisons where nutrition education may be unattainable for large scale interventions with one RDN serving a prison population of 120,000 or more as is the case in Texas.

Nutrition-Related Health Disparities

Food and health are indubitably related. The United States Department of Agriculture (USDA) DGAs state "the scientific connection between food and health has been well documented for many decades, with substantial evidence showing that healthy dietary patterns can help people achieve and maintain good health and reduce the risk of chronic diseases throughout all stages of the lifespan" (USDA, 2020a). Prison menus served to the incarcerated have health consequences.

A well-balanced healthy diet supplies required nutrients, vitamins, and minerals. Healthy dietary patterns include:

- "Vegetables of all types: dark green; red and orange; beans, peas, and lentils; starchy; and other vegetables
- Fruits: especially whole fruit
- Grains: at least half of which are whole grain
- Dairy: including fat-free or low-fat milk, yogurt, and cheese, and/or lactose-free versions and fortified soy beverages and yogurt as alternatives
- Protein foods: including lean meats, poultry, and eggs; seafood; beans, peas, and lentils; and nuts, seeds, and soy products
- Oils: including vegetable oils and oils in food, such as seafood and nuts" (USDA, 2020a)

Insufficient consumption of nutrient-dense foods leads to underconsumption of essential nutrients (USDA, 2020a). Specifically, added sugars, saturated fat, sodium, and alcoholic beverages are not included in a healthy diet pattern. Current prison menus provide excessive sodium and added sugar (Collins & Thompson, 2012) and therefore are at risk of supplying

insufficient nutrient-dense foods to promote good health. The DGAs note that vitamin D, calcium, potassium, and fiber are commonly under consumed nutrients considered "dietary components of public health concern for the U.S. population because low intakes are associated with health concerns" (USDA, 2020a). Added sugar and sodium are also of concern because overconsumption is correlated with negative health impacts. Prison menus emulate similar poor American dietary patterns.

Vitamin D

Required for bones to absorb calcium, vitamin D consumption is especially important from age 18-30 when bone mass is accruing (USDA, 2020a). The body can absorb vitamin D from dietary food sources or from sunlight. Inadequate vitamin D intake is associated with low bone density, "diabetes, cardiovascular disease, cancer, infectious disease, immune function, metabolic dysregulation, and mental health disorders" (Jacobs & Mullany, 2015). Less than 10% of Americans consume enough vitamin D (USDA, 2020a). Correctional menus analyzed by Collins and Thompson (2012), Cook et al. (2015), and Holliday and Richardson (2021) all yield low Vitamin D content. Individuals with low dietary vitamin D intake are at increased risk of vitamin D deficiency, particularly when recreation and sunlight hours are restricted (Jacobs & Mullany, 2015).

The incarcerated persons in minimum security facilities receive 5-10 hours of sunlight daily, but maximum-security facilities may allow only one hour (Nwosu et al., 2014) necessitating sufficient vitamin D from the menu. Even more problematic is the prevalence of vitamin D deficiency among the incarcerated. A study in a Maricopa County jail determined that individuals housed longer than 1 year developed a vitamin D deficiency (Jacobs & Mullany,

2015). Likewise, a vitamin D deficiency occurred in 50.5% of blacks, 29.3% of whites, and 14.3% of Asian residents in Massachusetts prisons (Nwosu et al., 2014). Inadequate menu offerings containing vitamin D exacerbated by limited sun exposure put institutionalized populations at risk for vitamin deficiency.

Approximately 90% of adults incarcerated longer than one year in an Arizona county jail were vitamin D deficient, compared to only 3.3% sufficient (Jacobs & Mullany, 2015). The Arizona incarcerated population consists of more Hispanic and black adults than the Massachusetts corrections population, which may explain the significant difference in the number of vitamin D deficient individuals. Also, the Arizona correctional facility is not equipped with outdoor recreation facilities and may contribute to the lower vitamin D status.

A study of 526 incarcerated adults in the Massachusetts Department of Corrections compared vitamin D status across males and females in various facilities at different times of the year (Nwosu et al., 2014). Residents in the maximum-security facility tests showed significantly lower vitamin D levels than a medium or lower security facility, most likely due to restrictive recreation. Vitamin D decreased during winter months. Facility security level and season are independent determinants for vitamin D levels.

The vitamin D blood levels of individuals in the Massachusetts study were 33% deficient, 34% insufficient, and 31% sufficient (Nwosu et al., 2014). Of the deficient group 50.5% were black, 29.3% white, 14.3% Asian, and 35% other. Skin pigmentation is the third independent variable for vitamin D status. Black persons have significantly lower vitamin D levels than white persons independent of security level and season. Even with sufficient vitamin D menu offerings as was the case in Massachusetts, individuals are still at risk of deficiency.

The menu analysis reporting the amount of vitamin D offered to the incarcerated may not correlate with how much is consumed. One possible explanation for inadequate vitamin D is how long the food is held under appropriate hot holding conditions. Large correctional facilities with centralized kitchens must transport hot meals to satellite facilities, which extends warm holding times. Lockdowns, shift changes (both resident and officer), and transportation delays prolong time between meal service and consumption. These long warm holding periods are associated with reduced vitamin D content in food (Eves & Gesch, 2003). Reduced intake of vitamin D fortified foods such as milk may also explain reduced vitamin D consumption. Many incarcerated individuals report lactose intolerance and avoid milk altogether (Nwosu et al., 2014). RDNs planning prison menus should consider these issues when determining nutritional adequacy.

Fiber

Adequate fiber as part of a healthy diet can reduce the risk of heart attack and colon cancer as well as help prevent and manage diabetes (Centers for Disease Control and Prevention, 2022a). Poor dietary patterns with insufficient fiber are associated with "onset and/or progression of diet-related chronic diseases" (USDA, 2020a). Fresh fruits and vegetables, whole grains, beans, peas, and lentils are all nutrient-dense sources of fiber. Whole grains are a better source of fiber than refined grains but are uncommon in prisons. Correctional menus should provide adequate fiber to promote and maintain health.

Only 3% of males and 10% of females in the U.S. consume enough dietary fiber. The Adequate Intake (AI) for fiber is 38g per day for males and 25g per day for females (Institute of Medicine 2005, 2005). Both county jails in South Carolina offered less than half of the fiber

Adequate Intake (Collins & Thompson, 2012). The large Georgia county jail menu only offered 13g of fiber, also less than half of the Adequate Intake (Cook et al., 2015). Only two out of 12 menus (Ohio and Wisconsin) from the Midwestern prisons study provided adequate fiber for males (Holliday & Richardson, 2021).

Low fruit and vegetable offerings are a major culprit for inadequate menu fiber. Neither of the county jail studies found adequate fruit or vegetable offerings for either males or females (Collins & Thompson, 2012; Cook et al., 2015). Ohio was the only state prison system that offered adequate vegetable servings to males, the other six regular menus offered less than the DGAs (Holliday & Richardson, 2021). Similarly, fruits in two county jails (Missouri and Ohio) were adequately offered, all other facilities fell short (see Table 2.2). Whole fruit, canned fruit, and fruit juice pose a security risk when used to produce contraband alcohol, and therefore may be intentionally limited on prison menus (Spalding Walters et al., 2015). Whole grains are another example of fiber-rich foods. Prison menus were not found deficient in grain servings. However, adequate grain servings and low fiber offerings suggest menus include refined grains and fall short serving whole grains. Collins and Thompson (2012) and Cook, et al. (2015) recommended offering whole grains and increasing fruit and vegetable servings to increase fiber.

Insert Table 2.2

Sodium

Hypertension and cardiovascular disease burden almost one in three incarcerated individuals. Lowering sodium intake "is a modifiable risk factor that can help improve blood pressure control and reduce risk of hypertension" (Institute of Medicine 2005, 2005). The Chronic Disease Risk Reduction levels set by the National Academies of Sciences recommend reducing sodium to 2,300 mg/day or less (National Academies of Sciences, Engineering, and Medicine, 2017). Manufacturers add salt during food processing and preparation thus increasing dietary sodium intake from highly processed dietary items. Processed and pre-prepared foods decrease foodservice labor demand in systems with high staff turnover such as prison kitchens. Current corrections menu sodium trends average 3,635 mg per day in state prisons (Holliday & Richardson, 2021), and as high as 4,542 mg per day in Georgia's county jail (Cook et al., 2015). Commissary options are excessively high in sodium (Rosenboom et al., 2018).

Potential Costs of Nutrition

Healthcare Costs

Prison medical facilities are equipped to support urgent care and chronic conditions. Larger correctional systems provide more comprehensive care while smaller systems depend on contract vendors (Huh et al., 2017). On-site medical care requires sufficient security staff to transport and supervise residents and appropriate medical professionals to perform specialty care. Facilities without specialists on staff contract with costly outside clinics or telemedicine.

Chronic conditions including hypertension, diabetes, and obesity burden health care costs. "In the U.S. health care system, chronic diseases, and the behaviors that cause them account for most health care costs. Indeed, nearly nine in 10 health care dollars nationwide go to

treat people with at least one chronic condition. Because they tend to visit the doctor more frequently, fill more prescriptions, and experience more hospitalizations, among other drivers, annual spending is more than double for those with one chronic condition, and more than five times as much for individuals with three" (Huh et al., 2017).

The Pew Charitable Trust reported that state Departments of Corrections spent over eight billion (excluding New Hampshire which did not report) on health care during Fiscal Year 2015 (Huh et al., 2017). Louisiana spent the least on health care per person at $2,173 in Fiscal Year 2015, and California spent the most at $19,796. Absence of continuity and uniformity of care is evident by the wide variations between state spending on health care.

Chronic and infectious diseases require frequent medical provider visits which account for about 37% of the prison health care spending (Schiff et al., 2014). BOP more efficiently spends only about 16% of their overall budget on medical care (Office of the Insepctor General, 2020). Medications make up a significant portion of medical costs. Insulin-dependent individuals require mediation to regulate blood sugar; between 2012 and 2016, insulin costs increased 15-17% per year (Mulcahy et al., 2020). The Virginia DOC spent $2.17 million on diabetes medication, about 11% of the overall medication budget (Norment et al., 2018).

Correctional facilities help eligible individuals enroll in Medicaid to offset health care costs for expensive outpatient services (Baumrucker, 2021). The State Health Reform Assistance Network reported that Medicaid funded health care costs in Michigan ($19 million), Colorado ($5 million), Arkansas ($6.4 million), California ($750 million), Pennsylvania ($108 million), and Maryland ($13.6 million) in FY 2015 (Bachrach et al., 2016). Federal and state allocations directly to correctional systems and reimbursements from Medicaid are all funded by taxpayers.

Aging

The number of aging adults in federal facilities increases for two reasons: more older individuals receive prison sentences and individuals who were sentenced for long periods of time are aging in prison (Goodwin et al., 2017). Chronic conditions and infectious diseases are 3 times more common among older adults than younger adults (Maruschak, 2015). Both an increase in the number of older adults and the number of health issues that these residents have impact correctional medical departments.

Aging individuals in federal facilities are 8% more expensive to incarcerate than younger individuals (Office of the Insepctor General, 2020). Younger adults cost about $22,676 where aging adults cost $24,538 to incarcerate in FY 2013. “BOP institutions with the highest percentages of aging [incarcerated individuals] in their population spent five times more per [person] on medical care ($10,114) than institutions with the lowest percentage of aging [individuals] ($1,916). BOP institutions with the highest percentages of aging [individuals] also spent 14 times more per [person] on medication ($684) than institutions with the lowest percentage ($49)” per year. The Virginia DOC corroborates that health care for persons 55 years and older costs more than younger persons (Norment et al., 2018).

Polypharmacy, individuals taking multiple prescriptions for various reasons, is common among the aging population. The incarcerated are not immune to polypharmacy. Inflated medication costs deplete correctional medical budgets, especially for those receiving multiple medications. The federal prison system estimated spending $111.7 million in FY 2016, an increase from $61.4 million in FY 2009 (Goodwin et al., 2017).

Establishments of Menu Adequacy

First published in 1980, the DGAs are periodically updated to "promote health, help reduce risk of chronic disease, and meet nutrient needs" (USDA, 2020a). Federal programs including Child Nutrition Programs; Special Supplemental Nutrition Program for Women, Infants, and Children; Supplemental Nutrition Assistance Program; Meals on Wheels; etc. base policies and programs on DGAs (USDA, 2020b). State prisons are not federally funded and therefore are not required to base policies and programs on the DGAs.

Dietary Guidelines for Americans

The USDA conducts a rigorous and robust review of current evidence as the basis of the DGAs (USDA, 2020a). These guidelines are widely accepted in the United States because they are science-based, peer-reviewed, and reflect the growing evidence in research as they are updated every five years. These guidelines are consistent with best practices for optimal nutritional health (USDA, 2020a). Specific nutritional goals detailed in the DGAs outline allowances, upper and lower limits, and acceptable intake ranges of essential nutrients; these goals are defined at the end of this chapter.

Dietitians reviewing prison menus for nutritional adequacy apply Dietary Reference Intakes, Recommended Daily Allowances, Acceptable Macronutrient Distribution Ranges, Estimated Average Requirements, and Adequate Intake goals outlined in the DGAs (Holliday & Richardson, 2021). Cook, et al (2015) compared Georgia's county jail menus to MyPlate guidelines, Acceptable Macronutrient Distribution Ranges, and Dietary Reference Intakes (Cook, et al., 2015). MyPlate guidelines replaced the Food Guide Pyramid in 2011 shortly before

Collins and Thompson (2012) assessed adequacy using the Food Guide Pyramid (Collins & Thompson, 2012).

The DGAs are ideally applied individually based on age, gender, body composition, and physical activity (USDA, 2021). Prison populations include diverse individuals whose health demographics vary making dietary requirement application to an individual difficult. Although an RDN applies general guidelines to determine overall menu adequacy, which goals and guidelines to apply to the diverse population remains unclear. Collins and Thompson (2012) referred to guidelines for a 35 [year old], 5'10", 154 pound, sedentary, non-smoker male whose Body Mass Index was 22 to determine nutritional adequacy; the female menu referred to guidelines for a 35 [year old], 5'4", 126 pound, sedentary, non-smoker female whose Body Mass Index was 22 (Collins & Thompson, 2012). In contrast, Cook, et al. (2015) used guidelines for a 5'9.3", 195-pound, sedentary male and a 5'3.8", 166.2-pound, sedentary female to determine nutritional adequacy (Cook et al., 2015). Inconsistent guideline estimates for a diverse population exacerbate inconsistent nutritional offerings in prisons.

Furthermore, the DGAs provide calorie recommendations for each gender and age group determined by physical activity level. Macronutrient distribution goals are: 10-35% from protein, 45-65% from carbohydrate, 20-35% from fat. The DGAs suggest fiber should be consumed at 14 g per 1000 calories. Similarly, less than 10% of calories should be consumed from saturated fat and added sugars consumed. The Chronic Disease Risk Reduction limits sodium intake to less than 2300mg per day. Vitamin D requirements based on Recommended Dietary Allowance guidelines recommend adults consume 600 international units (IU) per day. (USDA, 2020a, Appendix 1).

One-size-fits-all menus are beneficial in mass produced prison kitchens. However, satisfying thousands of taste preferences is challenging. Previous corrections menu reviews show excessive calories (Collins & Thompson, 2012; Cook et al., 2015; Holliday & Richardson, 2021); one possible explanation is providing excessive calories and food will ensure that picky eaters have access to sufficient energy for their needs. However, this trend is not established in current research.

Summary

This review of literature focused on research describing the nutrition environment in U.S. correctional facilities. RDNs review menus for nutritional adequacy without comparing them to validated guidelines. Two county jail menus and a study of state prisons showed inadequate correctional nutrition offerings (Collins & Thompson, 2012; Cook et al., 2015; Holliday & Richardson, 2021). Accreditation standards do not specify appropriate nutrition guidelines.

Incarcerated individuals are more likely to have at least one additional condition than the general U.S. population (Bai et al., 2015; Harzke & Pruitt, 2018). Chronic conditions are more prevalent among racial minorities who are incarcerated at higher rates than white Americans (Maruschak & Buehler, 2019). Prisons house increasingly more aging adults, and geriatric status defined at 55 years old is younger in prison than the non-incarcerated population (Skarupski et al., 2018; Widra, 2020). Female incidence of chronic conditions is higher than males, and females are consistently overfed from receiving male-designed menus (Binswanger et al., 2009).

Inadequate prison menus and reduced sunlight exposure in correctional facilities leads to vitamin D deficiencies (Jacobs & Mullany, 2015; Nwosu et al., 2014). Poor fiber and excessive sodium offerings perpetuate poor health outcomes from prison menus (Cook et al., 2015;

Holliday & Richardson, 2021). Poor health outcomes and a high aging population correlate with increased medical costs.

Approximations for nutrient recommendations vary across prison systems and may contribute to inconsistent nutrition offerings. Current reviews for nutritional adequacy clash based on guidelines used and approximate demographic representing prison populations. Consistent guideline usage across prison systems ensures appropriate comparisons and expose inadequate nutrition offerings served to the incarcerated population.

Definition of Terms

Acceptable Macronutrient Distribution Range (AMDR): "a range of intakes for a particular energy source [protein, carbohydrate, or fat] that is associated with reduced risk of chronic diseases while providing adequate intakes of essential nutrients. The AMDR is expressed as a percentage of total energy intake because its requirement, in a classical sense, is *not* dependent of other energy fuel sources or of the total energy requirement of the individual… If an individual consumes below or above this range, there is a potential for increasing the risk of chronic diseases shown to affect long-term health, as well as increasing the risk of insufficient intakes of essential nutrients" (Institute of Medicine 2005, 2005, pp. 14-15).

Adequate Intake (AI): "the recommended average daily intake level based on observed or experimentally determined approximations or estimates of nutrient intake by a group (or groups) of apparently healthy people that are assumed to be adequate – used when an RDA cannot be determined" (Institute of Medicine 2005, 2005, p. 3).

Chronic Disease Risk Reduction Intake (CDRR): a category of Dietary Reference Intakes specifically applied to sodium and phosphorous. "The sodium CDRR [is] the lowest level of intake for which there was sufficient strength of evidence to characterize a chronic disease risk reduction" (National Academies of Science, Engineering, and Medicine, 2019, p. 415)

Dietary Reference Intakes (DRI): "the reference values, collectively called the Dietary Reference Intakes (DRIs), include the Estimated Average Requirement (EAR), Recommended Dietary Allowance (RDA), Adequate Intake (AI), and Tolerable Upper Intake Level (UL)" (Institute of Medicine 2005, 2005, p. 21). "DRIs serve as benchmarks that can be used to assess inadequacy for a population and for an individual, and also to assess the potential for adverse effects caused by excess. DRIs are set for groups defined by life stage and gender. The

framework used to set the current DRIs focuses on intakes that prevent deficiency as well as intakes that prevent adverse effects. Additionally, the existing DRI framework allows for the integration of data on safety, efficacy, and the reduction of chronic diseases, to the extent that specific evidence exists" (National Academies of Sciences, Engineering, and Medicine, 2017, p. 190).

Estimated Average Requirement (EAR): "the average daily nutrient intake level estimated to meet the requirement of half the healthy individuals in a particular life stage and gender group" (Institute of Medicine 2005, 2005, p. 3).

MyPlate: MyPlate is a translation of the DGAs to consumers. "The Dietary Guidelines for Americans is developed and written for a professional audience. Therefore, its translation into actionable consumer messages and resources is crucial to help individuals, families, and communities achieve healthy dietary patterns" (USDA, 2020a, Executive Summary).

Recommended Dietary Allowance (RDA): "the average daily dietary nutrient intake level sufficient to meet the nutrient requirement of nearly all (97 to 98 percent) healthy individuals in a particular life stage and gender group" (Institute of Medicine 2005, 2005, p. 3).

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Table 2.1 Comparison of Health Conditions in Prisons and the General U.S. Population[a]

Condition	Federal	State	General Population
Obesity	32.3%	44.0%	37.0%
Hypertension	27.3%	34.5%	18.8%
Diabetes	8.8%	13.2%	10.6%
Heart Attack	3.3%	3.1%	2.0%

[a]Wilper et al., 2009

Table 2.2 Fruit and Vegetable Offerings in Correctional Facilities

	Vegetables (cup-equ)	Fruit (cup-equ)
Male Servings Recommended[a]	3	2
Female Servings Recommended[a]	2.5	1.5
Ohio DOC[b]	3.3	3.4
Iowa DOC[b]	2.9	1.2
Missouri DOC[b]	2.8	2.3
Minnesota DOC[b]	2.4	1.4
Illinois DOC[b]	2.3	1.0
Kansas DOC[b]	2.2	1.0
Wisconsin DOC[d]	1.8	1.9
Horry County Jail (in South Carolina)[b]	1.3	0.6
South Carolina County Jail[b]	1.3	1.1
County Jail in Georgia[c]	1	1.2

[a]*(Institute of Medicine 2005, 2005) Male recommendations based on a 2,400-calorie diet; female recommendations based on an 1,800-calorie diet.*

[b]*(Holliday & Richardson, 2021)*

[c]*(Collins & Thompson, 2012)*

[d]*(Cook et al., 2015)*

Chapter 3 - Methodology

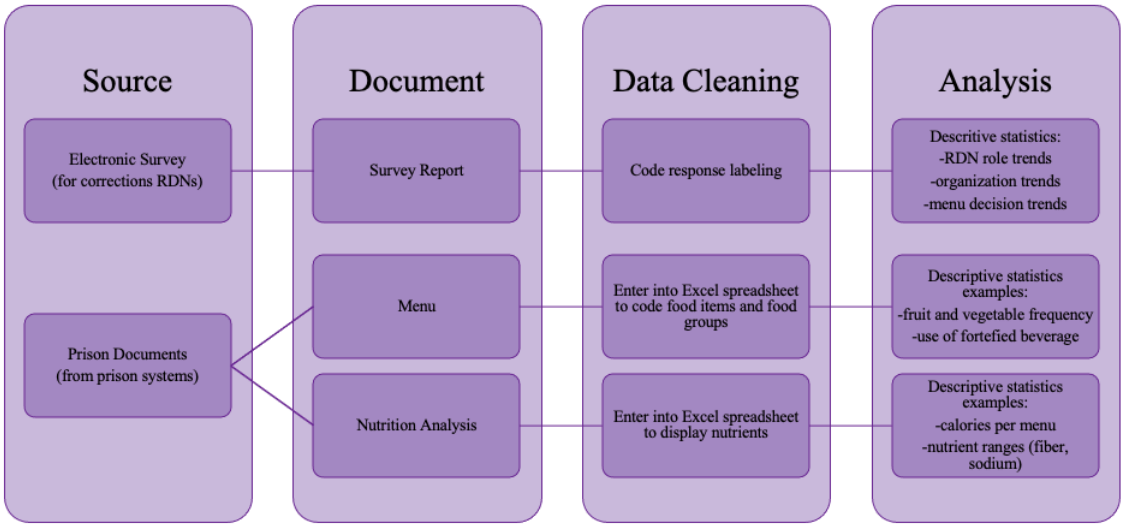
Introduction

The purpose of this study was to gain insight about factors influencing prison menus. Measurable factors include the current nutritional state of prison menus, the registered dietitian nutritionist's (RDN) role related to the menu, and the relationship between the corrections' organizational factors and nutrition offerings. Survey instrumentation developed for this project was distributed to corrections RDNs and compared with collected menu analyses. Study methodology is outlined in this chapter.

Study Design

Researchers collected data from data sources: prison menu and nutritional analysis documents, and a survey instrument provided to RDNs or corrections staff in each prison system. Figure 3.1 illustrates the data collection methods.

Figure 3.1 Data Collection Flow Chart



Population

This study primarily targeted all state prison RDNs to complete the survey. Each accredited state prison system must employ or contract with an RDN to review menus for nutritional adequacy (ACA, 2021; NCCHC, 2022). Each state system organizes employment uniquely, and RDNs possibly work in Medical, Foodservice, or Administrations departments. Locating the RDN in each state proved challenging.

State Departments of Corrections are not required to provide contact information for contract employees. A few contract companies hire groups of dietitians who review prison menus by region, not assigned to one specific state. Researchers successfully obtained contact information for 34 RDNs from 26 state prison systems and extended invitations to each RDN to participate in the survey.

All master menus in each state offered to the general population were included in this population. Master menus consist of either separate menus for males and females or one menu for both genders. A nutrition analysis is not required to determine nutritional adequacy, but RDNs often employ nutrition software to produce a nutrition analysis summary to analyze menu nutrition content. Researchers requested menus and associated nutrition analysis summary information for each menu offered. Medical diets were not included in selection criteria as dietitians are assumed to create and analyze medical diets for appropriateness and nutritional requirements given medical conditions. Holiday menus were also excluded as they are not part of the regular cycle menus and nutritional impact from one days' menu should not significantly alter the overall nutrition offerings.

All states were included to represent the population accurately. Stratifying by population size introduces bias as larger systems require unique budgetary systems or additional staff.

Regionally stratifying prisons ignores local dietary preferences influencing menu decisions made at the circuit court level. Research focusing on subsets may prove useful to influence local legislation. However, impacting national standards requires national surveying. This study is the first in the United States to explore factors influencing nutrition in corrections departments to understand prison menus nationally.

Measures

The research questions of this study were:

1. What is the current state of prison menus nutritionally?
2. How does the RDN's role relate to the menu?
3. What is the relationship between corrections' organizational factors and nutrition offerings?

Data Collection

Menus and Nutrition Analysis

The Freedom of Information Act passed in 1967 allows the public to request access to records from federal agencies (Civil Rights Division, 2022). Most states adopted similar guidelines, commonly known as open records, which apply to corrections departments (National Freedom of Information Coalition, 2022). Document requests that pose a security threat or unduly burden or interfere with the operations of the public body are not honored; each state system determines which documents meet this disqualification of dissemination. Generally, menus and nutritional analyses are available upon request.

Although menus are reviewed at least annually, menus are not updated annually; state employees are not required to produce new documents upon request including menus or nutrition analyses. Therefore, researchers requested the most current versions of all master menus including gendered, age (pediatric vs geriatric), religious (Kosher vs Halal), vegetarian, and vegan, and the accompanying menu analysis. Two RDNs provided documents directly. Five records departments were non-responsive after multiple emails, requests, and reminders. Three Departments of Corrections would not provide any information to individuals who are not residents of that state. Two states post copies of menus online, and one even makes the nutrition analysis available online.

Many records departments did not respond with complete information. Nine states sent either the menu or the nutrition analysis, not both. One Department of Corrections approved dissemination of the menu but required approval from prison Administrators to release menu analysis information; the request was not approved even 12 weeks after the initial request and many reminders. Systems contracting with dietitians had menu documents less readily available and took longer to respond to requests if at all. At least three dietitians provided a menu manual outlining general food items required in meals but left specific menu items to the director's discretion. These RDNs did not provide nutrition analyses with menu outlines due to meal ambiguity.

Survey Development

The availability of survey methodological instruments used specifically in the corrections sector are limited. Validated surveys for correctional professionals ask about mental health to determine wellness indicators and especially seek out correctional officers (National Institute of

Corrections, 2017). Surveys targeting correctional health care professionals include obtaining initiatives to reduce prevalence of infectious diseases (Maner et al., 2022). Other surveys request information from medical administrators about health care administration (Chari et al., 2016). A survey specific to corrections RDNs has not previously been developed or tested. However, sample selection for correctional health care professionals involves recruiting participants through professional associations and was used in this study for recruitment. The Association of Correctional Foodservice Affiliates and the Dietitians in Health Care Communities practice group of the Academy of Nutrition and Dietetics connect corrections RDNs through sub-groups within the affiliation membership; these associations are one resource of corrections RDN survey recruitment.

The researchers developed a survey instrument to obtain quantitative data for analysis. The instrument included items to assess the foodservice system including the current state of prison menus, RDN role in menu development and approval, and organizational structure items. Qualtrics Survey System (Provo, UT) hosted and kept survey items and responses secure.

A pilot survey was distributed to five (about 10% of the anticipated population) corrections professionals and subject matter experts, including Mitchel Holliday, EdD, who serves as the Chief Dietitian for the Federal Bureau of Prisons. Participants were asked to provide feedback on appropriateness and clarity. Only three of the RDNs completed the pilot survey. Feedback from the pilot survey was incorporated into the final survey before distribution to current corrections RDNs.

The final survey version was included in the application for approval by the Kansas State University Institutional Review Board (IRB) on March 1, 2023 (see Appendix A for survey instrument). A participation invitation letter outlining the voluntary nature of the survey and

debriefing letter reminding participants that the data collected in this study will not be used in any future research studies or distributed to others was included in the IRB application (see Appendix B for letters). The research proposal was determined as exempt from further review on March 3, 2023.

Survey Distribution

Survey development concluded by March 20, 2023, and was distributed upon obtaining RDN or foodservice director contact information. Departments within systems employing an RDN vary by state organizational structure, and therefore RDN contact information proved challenging to obtain. However, each prison system employs a foodservice director and medical administrator, or equivalent positions, and professionals in these positions were invited if an RDN was not available. Researchers accessed Association of Correctional Foodservice Affiliates membership data to locate RDNs, but only found retired dietitians in membership records. Researchers also sent an email through the Academy's Dietitians in Health Care Communities practice group listserv and requested that current state corrections RDNs respond; this step ensured that the participant met population demographics and listserv protocol was not violated. IRB specifications were followed.

The survey was administered by Qualtrics Survey System (Qualtrics, Provo, UT). Qualtrics data and responses were password protected for security in storing participant responses. The survey invitation letter explained the voluntary nature of participating, and no negative consequences were anticipated. A financial incentive for RDNs to complete the survey was not available; however, encouraging completion as a professional service and a means to

improve corrections menus was explained. A summary of survey results was offered as motivation to participate.

At least 25 Departments of Corrections requested an application to conduct research before allowing dietitians to participate in the survey. The application process in some cases involved a background check for all persons with access to data. Applications required principal investigator signatures and resumes, assurance of data access and storage security, signed agreements to allow Departments of Corrections to review any manuscripts at least 10 days prior to publication, copies of survey questions and invitation letters, and the Kansas State University IRB approval letter. Research applications were required in systems with designated research departments and resembled the Kansas State University IRB process. Only four applications were rejected and further explained that the research accommodations were at capacity for that system. Research conducted in prisons can require staff resources and excessive simultaneous research can burden the system. Sixteen applications were approved and took from five days to 12 weeks to review. Five applications were still pending by the time data collection completed on June 2, 2023.

Data Analysis

Menus and Nutrition Data

Upon collection, all menu and nutrition analysis data were extracted and entered into an Excel spreadsheet as outlined in Table 3.1. The notes column mentioned if menus included a fortified beverage. This spreadsheet allows for comparisons between state offerings and overall prison menu statistics. A duplicate spreadsheet allows researchers to maintain original data and

create new analyses using Excel to calculate ranges, averages, and frequencies to draw conclusions from collected data.

Insert Table 3.1

Pertinent statistics gleaned from menu documents include gender-specific menu frequency, average calories, fiber, and sodium ranges, and servings of fruit and vegetables per day. These descriptive statistics provide insights on menu nutritional appropriateness for target prison demographics. Other relevant comparisons for systems employing contract dietitians and nutritional value of the menu are available from collected data.

Survey Data

All RDNs employed with the state Departments of Corrections were invited to participate. If communication with the foodservice director was established, they were also invited to participate in the survey. Dr. Mitchel Holliday reviews and approves menus for the Federal Bureau of Prisons and participated in the pilot study; he was not included in the survey distributed to correctional dietitians given his involvement with this study. One state system was so large that neither the main office nor records department could provide contact information for any dietitians working with menus. One dietitian refused participation for fear of losing her job. Five dietitians received survey invitations and then quit communication without survey completion. At least three research units required the survey invitation include the research staff

copied on the email. Although the survey was administered electronically, five research units provided responses on the pdf survey provided with the research application. In total, 24 completed surveys were recorded.

Descriptive statistics provide insight on correctional dietitians. Survey questions ask types of menus served, foodservices responsiveness to RDN menu recommendations, guidelines referred to during the menu approval process, and organizational structures influencing menu decisions. Comparisons between descriptive statistics and menu offerings were made.

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Table 3.1 Menu Extraction Details

Data Category	
General	***Nutrition Analysis***
Population size	Daily calories (kcal)
Contract status	Protein (g)
Cycle length	Carbohydrate (g)
	Fat (g)
Menu	Saturated fat (g)
Menu type	Sodium (mg)
Fresh fruit servings (cup-equ per day)	Fiber (g)
Total fruit (cup-equ per day)	Vitamin D (IU)
Starchy vegetables (cup-equ per week)	Vitamin D (mcg)
Total vegetables (cup-equ per day)	

Chapter 4 - Menu and Nutrition Analysis Findings

Introduction

The incarcerated population primarily receives nutritious food from prison master menus. Inadequate prison menus are a modifiable risk factor for nutrition-related chronic conditions and increased health care costs. In addition, commissary prison stores offer shelf-stable foods which were found to be inconsistent with MyPlate guidelines (Rosenboom et al., 2018). Accreditation standards requiring nutritional adequacy are allusive and general. Even where Registered Dietitian Nutritionists (RDNs) are involved in the menu approval process, it is unclear what influence these nutrition professionals have on prison menus.

Prisons lack menu development specificity, including whether to provide separate menus for males and females. Holliday and Richardson (2022) reported half of the 12 states assessed provided incarcerated females menus designed for males. Weight gain and other non-communicable diseases are higher among incarcerated females than their male counterparts (Binswanger et al., 2009). Persistent overfeeding and weight gain are correlated (Leaf & Antonio, 2017) and suggest the need for female-centric menus for incarcerated females. Specifically, the Dietary Guidelines for Americans (DGAs) published by the United States Department of Agriculture (USDA) recommend calories, macronutrients (protein, carbohydrate, and fat), and fiber intake according to gender (USDA, 2020a). Accreditation standards, nutrition guidelines, and the absence of prison menu regulations create discord between nutrition provided by gendered menus and DGA recommendations. Although females make up a small portion of prison populatoins, it is important to provide appropriate nutrition offerings (see Appendix C for prison population by state and gender).

Previous studies on corrections menus found excessive calories and sodium, and insufficient vegetables, fiber, and vitamin D offered (Collins & Thompson, 2012; Cook et al., 2015; Holliday & Richardson, 2021). Other micronutrients shown as insufficient on nutrition analyses are also not required on nutrition labels which may explain supposed deficiencies. However, each inadequate nutritional offering has potential to exacerbate health issues dependent on these meal trays during long prison stays. Appropriate nutrition is imperative to health among the incarcerated.

The DGAs highlight the correlation between insufficient fiber intake and the nutrition-related chronic diseases (USDA, 2020a). Excessive sodium consumption is a modifiable risk factor for cardiovascular disease and stroke. Vitamin D deficiency is common among the incarcerated population (Jacobs & Mullany, 2015; Nwsou et al., 2014; Eves & Gesch, 2003), and prison menus commonly offer insufficient vitamin D (Collins & Thompson, 2012; Cook et al, 2015; Holliday & Richardson, 2021). Other environmental factors during incarceration also contribute to vitamin D deficiency.

Adults aged 19 years and older should consume two cup equivalents (cup-equ) of fruit per day if consuming a 2000-2600 calorie diet, or 2.5 cup-equ per day if consuming 2800-3000 calories (USDA, 2020a). The DGAs note that "dietary patterns that do not meet recommended intakes of fruits [and] vegetables… contribute to low intakes of dietary fiber;" prison menus do not serve enough fiber (Collins & Thompson, 2012; Cook et al, 2015; Holliday & Richardson, 2021). For this reason, fresh fruits are included in the overall analysis to assess dietary fiber adequacy. Americans should consume a variety of vegetables as part of a balanced diet (USDA, 2020a), see Appendix D Table D.1 for specific vegetable subgroup recommendations.

The objectives of this research are to describe current nutrition offerings in U.S. prison menus and determine factors related to menu and nutrition decisions. The research question addressed in this chapter is: what is the current state of prison menus nutritionally?

Methodology

Data Collection

This research provided insight into the nutrition offerings offered to the U.S. state prison population. Although menus are reviewed at least annually, menus are not updated annually; state employees are not required to produce new documents upon request including menus or nutrition analyses. Therefore, researchers requested the most current versions of all master menus including gendered, age (pediatric vs geriatric), religious (Kosher vs Halal), vegetarian, and vegan, and the accompanying menu analysis. Types of menus collected are represented in Table 4.1. Other religious menus received through records requests included "Nation of Islam (How to Eat to Live); No Animal Product," meat free, pork free, or were not specifically labeled.

Insert Table 4.1

Twenty-five Departments of Corrections (DOCs) required an application to conduct research before allowing dietitians to participate in the survey. The application process in some cases involved additional background checks for all persons with access to data. Applications required principal investigator signatures and resumes, assurance of data access and storage

security, signed agreements to allow DOCs to review any manuscripts at least 10 days prior to publication, copies of survey questions and invitation letters, and the Kansas State University Institutional Review Board approval letter. Research applications were required in systems with designated research departments and resembled the Kansas State University Institutional Review Board process. Only four applications were rejected and further explained that the research reviews and accommodations were at capacity for that system. Research conducted in prisons can require staff resources and excessive simultaneous research projects can burden the system. Sixteen applications were approved and took from five days to 12 weeks to review. Five applications were still pending by the time data collection completed on June 2, 2023. Due to the number of states requiring review prior to publication, many state identifiers are not included to avoid censorship.

Many records departments did not respond with complete information. Only 33 states provided any type of documentation, while 17 did not respond. Nine states sent either the menu or the nutrition analysis, not both. Systems contracting with dietitians had menu documents less readily available and took longer to respond to requests if at all. At least three dietitians provided a menu manual outlining general food items required in meals but left specific menu items to the director's discretion. These RDNs did not provide nutrition analyses from menu outlines due to meal ambiguity and discretion provided to foodservices.

Two RDNs provided documents directly. Records departments in Maryland, New York, Oklahoma, North Dakota, and South Dakota were non-responsive after multiple emails, requests, and reminders. Alabama, Arkansas, and Delaware would not provide any information to individuals who are not citizens of those states. Minnesota and Florida post current menus online, and Minnesota provides the nutrition analyses online.

Data Analysis

Researchers input data from menu and nutrition analysis documents gathered into a spreadsheet for further comparisons between state offerings and overall prison menu statistics, see Table 4.2 for specific nutrients analyzed. These comparison statistics provide insights on menu nutritional appropriateness for target prison demographics. The following stipulations were applied while analyzing menu data to ensure items were appropriately assigned to food groups:

- Beans, chickpeas, and black-eyed peas were included in the "Beans, Peas, Lentils" vegetable subgroup, not as a starchy vegetable (USDA, 2020a)
- The cornmeal in cornbread contributed to "Grains" (USDA, 2020a)
- Grits served at breakfast were not included as vegetables as the DGAs include grits in the "Refined Grains" category (USDA, 2020a)
- Breads and desserts with fruit were not counted as a fruit (for example, a blueberry muffin was not included in fruit servings)
- Soups were counted as 0.5 of the stated serving as soups are often watery
    - Every other serving of soup was counted as a starchy vegetable
- Chips were not included in vegetable servings
- Peanuts were counted as "Nuts, Seeds, Soy Products" (USDA, 2020a)
- Ambiguous menu item labels such as "fruit" or "vegetable" were counted alternatingly as fresh, canned, and starchy (for vegetables)
- Sweet potatoes and butternut squash were part of the "Red and Orange Vegetables" vegetable subgroup, not starchy (USDA, 2020a)
- Entrees with vegetables such as Fried Rice, Chili Macaroni, Beef and Bean Burritos were counted as 0.25 serving of vegetables

Starchy vegetables were counted as outlined by the DGAs as "all fresh, frozen, and canned starchy vegetables: for example, breadfruit, burdock root, cassava, corn, jicama, lotus root, lima beans, immature or raw (not dried) peas (e.g., cowpeas, black-eyed peas, green peas, pigeon peas), plantains, white potatoes, salsify, tapioca, taro root (dasheen or yautia), water chestnuts, yam, and yucca" (USDA, 2020a).

Results

Menu Type

Analyzing types of menus available in each prison system provides insight on the nutritional appropriateness each menu type offers the diverse prison population. A total of 29 states made master menus available and 21 states made master menu nutrition analyses available. See Figure 4.1 for a visual representation of how many state prison systems were represented in this phase of data collection. California and Georgia provided nutrition analyses and master menus; however, these master menus did not detail portion sizes and therefore were not calculated in the fruit and vegetable servings analyses.

Insert Figure 4.1

Connecticut, Hawaii, Texas, Utah, Vermont, and Wyoming ignored nutrition analysis requests and only provided master menu copies without analyses. New Hampshire required prison Administration approval for nutrition analysis dissemination; after 12 weeks of requests

and reminders, Administration was unresponsive. Arkansas did not provide menu analysis upon request but did respond via email stating that menus should provide 3,000 calories and 80 grams protein on average per day. Upon initial contract with Louisiana, the RDN provided the DOC a complete nutrition analysis; however, the analysis is not regularly updated and was not available during data collection. Maine and Wisconsin provide general guidelines and a dietitian-written nutrition manual to foodservices but does not regularly produce a nutrition analysis. Due to the general guidelines, fruit and vegetable servings and overall nutrition analysis information for these states were not included in further analyses.

The Religious Land Use and Institutionalized Persons Act requires prisons to allow incarcerated persons to observe religious practices during incarceration (Civil Rights Division, 2015). Any incarcerated individual can request religious menus, and availability of religious dietary patterns vary by prison system. Typically, DOCs offer Kosher, Halal, vegetarian, vegan, or other religious dietary patterns. Table 4.1 outlines the religious meals made available by the 29 states which provided master menus. The nature of this research is an overall evaluation of nutrition offerings in prisons and primarily focuses on non-religious gendered menus. Religious and seasonal menus are reported but not analyzed or compared with gendered menus. The DGAs recommend vegetarian and Mediterranean-style dietary patterns that should be considered when developing religious and alternative entrée program menus (USDA, 2020a).

In 52.9% of states that provided menus, females receive menus developed for males. Eighteen states serve the same menu to males and females and provide excessive energy and nutrients to females. Only 44.1% of states, or 15 of 33, serve females with menus designed specifically for females. Appendix C illustrates the male and female population between Federal Bureau of Prisons and each state prison system. State prison systems house about 67,762 or

7.67% females and 815,716 or 92.33% males; females comprise about 6.79% of the Federal Bureau of Prisons population, similar to the state population profile. Despite the fraction of females to males, it is nutritionally inappropriate for prisons to overfeed incarcerated females.

Average Nutrient Offerings

Adequate calories, macronutrients, sodium, and fiber indicate measurable appropriate menu nutrition. Because the incarcerated population struggles with vitamin D sufficiency, this analysis reviews vitamin D offerings (Cook et al., 2015; Holliday & Richardson, 2021; Collins & Thompson, 2012). Other micronutrients are commonly underreported because the United States Food and Drug Administration only requires nutrition labels to report saturated fat, *trans* fat, dietary fiber, total sugars, added sugars, Vitamin D, calcium, iron, and potassium (United States Food & Drug Administration, 2022). The added sugar data was inconsistent as only California, Idaho, Illinois, Montana, Oregon, and Pennsylvania reported these values; added sugar is not reported in this research due to the limited number of states reporting this value. In total, 21 prisons provided nutrition analyses for this assessment, 47 menus included calories, 36 included protein, 34 included carbohydrate, 35 included fat, 29 included saturated fat, 34 included sodium, 33 included fiber, 6 included vitamin D (IU), and 15 included vitamin D (mcg). See Table 4.2 for overall menu nutrient analysis averages compared to DGA recommendations.

Insert Table 4.2

Only 16 states developed female-appropriate menus. The highest calorie female menu served 2871 calories compared to the lowest served 2007 calories and averaged 2303 calories per day. The extra 371 daily calories females receive from unisex menus contribute significantly to excess caloric intake and possibly weight gain throughout long prison sentences. Of 67,762 current incarcerated females (see Appendix C), 36,931 receive meals developed for male nutritional requirements.

The highest calorie male menu served 3207 calories compared to the lowest served 2491 calories and averaged 2820 calories per day. The highest calorie menu served to males and females menu served 3000 calories compared to the lowest served 2025 calories and averaged 2674 calories per day (see Table 4.2).

The DGAs recommend adult males and females aged 19 and older consume 10-35% of calories from protein, 45-65% from carbohydrate, and 20-35% from fat (USDA, 2020a). Following the recommendations, the male and female should also provide nutrients as outlined in Table 4.2. The "average" column reflects the current offerings included in nutrition analysis data. Recommended values were calculated from DGA guidelines based on the average calories provided by each menu type.

The male and female menu's average protein, carbohydrate, and fat meet the DGA recommendations. Average sodium served from all menus was 3403 mg per day, which is 1.5 times the Chronic Disease Risk Reduction Intake recommendation. Fiber for each menu type is offered at less than the recommended 14g per 1000 calories. Vitamin D offerings for the male and female menus are reportedly served below the recommended 600 IU and 15 mcg (USDA, 2020a). These findings align with previous research reporting excessive sodium and saturated fat, and insufficient fiber and vitamin D (Cook et al., 2015; Holliday & Richardson, 2021;

Collins & Thompson, 2012). Vitamin D for the male menus and female menus exceed recommendations.

Male menus reflect similar findings (Cook et al., 2015; Holliday & Richardson, 2021; Collins & Thompson, 2012). Average saturated fat offered exceeds the maximum recommended intake of 10% of calories consumed, and the 33.8g fiber offered does not meet the 39.5 recommended intake. Contrastingly, sodium offerings were higher than the 2300mg recommendation. Vitamin D offerings meet the 600 IU required minimum; these values include menus serving vitamin D fortified beverages which may hyperinflate average offerings. Using the average of all male menus provided, the average male menu does not meet dietary recommendations.

Female menus sodium offerings were 1.4 times higher than the Chronic Disease Risk Reduction goals (see Table 4.2). Although the average female menu exceeded sodium recommendations, the 3128mg offered was still lower than the average of all other prison gendered master menus. Fiber servings at 28.6g per day do not meet the minimum recommended 32.2g per day based on the average calories provided (USDA, 2020a). Female menu vitamin D offerings met the 600 IU required minimum.

Each master menu provided in prisons falls short of the DGAs. The comparisons in this section analyzed recommendations based on current calorie offerings. Determining appropriate calories requires applying gender, age, and physical activity levels to each population demographic within prisons, see Appendix D for calorie recommendations. Adjusting menus to meet calorie needs also ensures menus meet appropriate minimum and maximum nutrient requirements.

Vegetable Servings

Prisons serve fresh, canned, frozen, and cooked vegetables. Starchy vegetables like potatoes, green peas, and corn yield higher calories than non-starchy vegetables with the same portion size and are especially enticing on prison menus. Table D.1 in Appendix D states the vegetable requirements for each vegetable sub-group including starchy. Vegetable servings are expressed in cup-equivalents (cup-equ) and are compared to recommendations in Table 4.3.

Insert Table 4.3

On average, none of the gendered menus offered enough total vegetable servings. The average female menu offers less than the recommended starchy vegetable servings and was the only menu not exceeding this upper limit. State prison systems providing separate menus for males and females frequently served a similar base menu and adjusted portion sizes to meet calorie needs. Male-specific menus differ from female menus by offering additional starchy vegetable servings.

Massachusetts, Minnesota, Oregon, and Washington's prison systems female menus offer sufficient vegetables. Arizona, Idaho, Kansas, Massachusetts, and Minnesota's systems serve less than the starchy vegetable upper limit on female menus. One female menu serves 7.5 cup-equ starchy vegetables per week, or 150% of the starchy vegetable recommendation. Similarly, one Midwestern state's female menu served 116% of the starchy vegetable recommendation, or

5.8 cup-equ per week. Massachusetts served 3.9 cup-equ starchy vegetables per week, or 78% of the recommendation.

The male menu which served the highest number of starchy vegetables provided 9.3 cup-equ servings per week, or 186% of the starchy vegetable recommendation. The next highest served 7 cup-equ per week, or 149% of the recommendation. Arizona and Oregon's male menus served the lowest cup-equ starchy vegetables, 2.2 cup-equ (44%) and 2.66 cup-equ (53.2%) respectively. Arizona's male menu only provided 1.73 cup-equ total vegetables per day, less than the 3.5 cup-equ recommended. Both Washington and Oregon's male menus serve 4 or more cup-equ total vegetables per day exceeding the recommendation.

Menus provided both to males and females reflect similar patterns. The menu serving the highest proportion of starchy vegetables provided 6.2 cup-equ starchy vegetables per week, or 124% of starchy recommendations. Vermont's menu only served 78% of the starchy recommendation or 3.9 cup-equ per week. The same state which served 124% of the starchy vegetable recommendation also only provided 1.8 cup-equ of total vegetables per day, not meeting the recommended 3.5 cup-equ per day.

Fruit Servings

Fresh fruit and total fruit servings were extracted and analyzed from collected menus. Fruit recommendations are based on the average calories provided by each menu (USDA, 2020a, p. 96). The average female, male, and female and male menu serves 1.2 cup-equ, 1.3 cup-equ, and 1.3 cup-equ respectively. The DGAs recommend at least double the current servings as outlined in Table 4.3.

Washington served 3 cup-equ fruit per day on the female menu, but the menu was unclear about how many were fresh fruits. Massachusetts provided 1.98 cup-equ fruit to females per day, half of which were fresh fruits. The other eight female menus collected offered less than the recommended 2 cup-equ fruit per day. The lowest fruit servings were from two states which offered 0.5 cups fruit per day, only one quarter of the recommendation. One state offers zero fresh fruit to females.

The average total fruit servings on male menus were 1.22 cup-equ per day, and fresh fruit was 0.77 cup-equ per day. One state serves zero total fruit, and two states offer zero fresh fruits per day to males. The next lowest fruit offerings were from one state which only serves 0.14 cup-equ per day and two others offering only 0.23 cup-equ per day. Washington's male menu is the only male menu to serve more than the recommended 2 cups; they serve 3 cup-equ.

Although the average menu served to both males and females serves 1.3 cup-equ total fruit per day, these menus only provided 0.5 cup-equ fresh fruit, less than gender-specific menus. Vermont's male and female menu exceeded all other states and served 3.2 cup-equ per day, 0.8 cup-equ were fresh fruit. The next highest fruit servings were offered by Missouri's male and female menu providing 2 cup-equ per day and 1.5 cup-equ of fresh fruit. Five states served less than 1 cup-equ fruit per day. Three states offered zero fresh fruit on the combined male and female menu. Incarcerated individuals receiving male and female menus received fewer fruit servings than male- and female-specific menus.

Fruit should be consumed whole, and less than half of fruit should be consumed from 100% fruit juice (USDA, 2020a). Many prisons serve fruit juice, either 100% or 50% concentrations. Three male and female combined menus serve over half fruit servings as fruit juice at 55.6%, 58.2%, and 91.1% of total fruit; three male (56.6%, 65.4%, and 100%) and two

female (60% and 100%) menus served over half of total fruit servings as fruit juice. Only one state served zero whole fruit and all fruit servings were offered in juice form. Eight state menus serve less than half of fruit servings as fruit juice and comply with the DGA recommendations. Some of this information is shown in Table 5.3 which will be discussed in the next chapter with contract services.

Fortified Beverage Use

Eighteen states included a fortified beverage at varying frequencies. Menus apply a variety of labels to describe fortified beverages including “fruit flavored drink,” “fortified flavored beverage,” and “fruit drink w/Vitamin C.” Two examples of fortified beverage manufacturer specification sheets are available in Appendix E.

To avoid censorship, names of the states including a fortified beverage are not listed in Table 4.4. Instead, the number of fruit servings corresponding to the frequency of fortified beverage use is compared. This table outlines which meals include a fortified beverage compared to the amount of total fruit offerings served on that menu. Half of the menus that served fortified beverages also serve less than 1 cup-equ fruit per day. Only two of the 18 menus serving fortified beverages meet the minimum recommended 2 cup-equ fruit serving per day.

Insert Table 4.4

Cycle Length

Prison menus repeat in perpetuity, and even long cycle menus may become monotonous to incarcerated individuals with long prison sentences. It is unclear if there is a relationship between cycle menu length and nutritional adequacy provided on prison menus. Table 4.5 compares female, male, and female and male menu cycle lengths to nutrition indicators.

Insert Table 4.5

A notable finding is that one male master menu serves zero fruit; no fresh, frozen, canned, or dried fruit served to males in this prison system. Average daily fruit servings on 21-day and 28-day menus are comparable as 21-day menus serve 1.57 cup-equ and 28-day menus serve 1.59 cup-equ. Other cycle lengths serve less fruits with 31-day menus averaging 0.49 cup-equ, 35-day menus averaging 1.07 cup-equ, and 42-day menus averaging 0.47 cup-equ servings of fruit per day. Vegetable servings averaged by cycle length yield similar results as the 7-day menu cycle serves 2.61 cup-equ and the 42-day cycle menu served 1.45 cup-equ daily vegetables. The other cycle lengths average vegetable servings were between 2.81 cup-equ and 3.06 cup-equ daily.

Thirty-two of the 45 state corrections menus collected were between 28-35 days long. Only one menu deviated from repeating weekly and instead repeated every 31 days. Five master menus repeated less frequently than 28 days: one repeated after 7 days and four repeated after 21 days. Of the 45 menus analyzed, 22 serve a four-week, nine serve a five-week, seven serve a six-

week, and one serves an eight-week cycle menu. A four-week cycle menu was most common for state prison systems.

Other nutrition comparisons between cycle length data are confounded with gendered and non-gendered menus. For example, average calories offered by 28-day cycle menus ignore lower target calories for females than males; the 28-day cycle menu average includes female-specific, male-specific, and combined male and female master menus. Fruit and vegetable servings are the most appropriate cycle-length comparisons; neither the average fruit nor vegetable offerings stratified by cycle-length meets minimum DGA recommendations.

Discussion

Menu Type

Records Transparency

The federal government complies with transparency laws outlined by the Freedom of Information Act "to ensure informed citizens, vital to the functioning of a democratic society" stated by the United States Department of Justice (United States Department of Justice, n.d, homepage). Information compromising document classification, personnel or medical files, trade secrets, some law enforcement, or national security may be exempt from transparency. Most state governments adopt similar policies, but procedures differ from state to state. Document request delays and misdirection are either intentional or inadvertent methods to discourage citizens from requesting information or to avoid providing information altogether. Researchers patiently requested menus and nutrition analyses from all 50 state prison systems; only 19 states provided all information requested, 33 states responded with any information, 29 states provided menus, and 21 provided nutrition analyses before data collection concluded.

Incomplete and avoidant responses suggest government gatekeeping for information that should be made public to keep citizens informed. Only two states did not provide documents because researchers were not residents of those states and only requests made by citizens of those states are honored. Researchers sent multiple requests and reminders to the 16 records departments and research units which did not respond; after 12 weeks when data collection concluded these requests remained unfulfilled. Inconsistency between states classifying menus and nutrition analyses as "protected" exposes possible intent to avoid making documents public against Freedom of Information Act objectives (United States Department of Justice, 2022). Citizens unable to determine prison menu offerings are also unable to advocate to correct wrongdoing or inadequacies. This major obstacle goes against values of a functioning democratic society.

To adequately assess prison menus, members of the public must have access to documents. State governments need to reevaluate their transparency policies and records request processes. There is no reason why menu and nutrition documents should be exempt from government transparency. Without appropriate transparency, the burden of information lies with the incarcerated population to report issues with menu adequacy; this population does not typically have the education or resources to properly determine or document menu nutrition issues. The government must do better to allow outside access to prison menu and nutrition documents.

Gendered Menus

Incidence of overweight and obesity are more common among incarcerated females than males (Herbert et al., 2012). Previous corrections menu research establishes some facilities serve

the same male-designed menu to both males and females (Cook et al., 2015; Holliday & Richardson, 2021). Those findings are in line with this research which reports that 52.9% of states serve one menu to males and females.

The DGAs recommend 2400 maximum calories for active 18–30-year-old females, see Appendix D, Table D.2 (USDA, 2020a); the average male and female combined menu served 2674 calories per day, 274 excess calories for the most active and youthful females in prisons. Active 19-35-year-old males should consume 3000 calories per day. Comparatively, a sedentary 51-year-old and older female should not consume more than about 1600 calories per day; a sedentary 61-year-old and older male's caloric intake should be about 2000 calories per day (see Appendix D for the DGA calorie recommendations). The average male and female menu provided 1074 calories over the recommended amount for older sedentary females, and 674 excess calories for sedentary older males. There is not a good way to delineate age and activity level even between genders when deciding target menu goals.

The average male and female combined menu does not meet the caloric needs for much of the prison population. A one-size-fits-all menu development approach is inappropriate for males and females alike, and corrections dietitians should refrain from approving a single menu for both genders. Even though females make up a small percentage of the incarcerated population (about 67,762 females), ignoring this segment exacerbates already troublesome weight gain females experience during prison stays.

Average Nutrient Offerings

Dietitians estimate nutrient needs from guidelines based on the average population demographics, but specific application varies between evaluators. For example, Collins and Thompson (2012) based nutrition requirements on the average U.S. male and female adult's heights and weights; Cook et al. (2015) estimated needs on a reference male and female possibly based on prison population demographics. It is unclear what other RDNs base nutrient needs on as the range of overall calories provided (which other nutrient goals are based on) is vast and does not relate to the DGA recommendations for any average demographic. One possible explanation for the high outliers is that corrections menus customarily overestimate calorie needs to accommodate picky eaters. However, consistent excessive intake from menu overestimations may even promote male weight gain from these menus.

Male prison menus offer inconsistent nutrients between state systems. Calories provided on male menus range from 2491 to 3207 kcal per day and averages 2820 kcal per day. Two states serve over 3000 calories per day to males, which is only appropriate for active males between 15 and 35 years old. Over 10% of the state incarcerated population is 55 years and older (Widra, 2020). The Federal Bureau of Prisons reports that aging individuals in their facilities are 8% more expensive to incarcerate than younger individuals (Office of the Insepctor General, 2020). Overfeeding the aging incarcerated population amplifies the health issues in this growing portion of the prison populations.

Female menus fare similarly; they provide between 2007 and 2871 calories and average 2303 calories per day. Two outlier states serve above 2800 calories to females per day. Without these outliers, the average female menu offers 2193 calories per day which is more appropriate than combined male and female menus, or female menus inflating female nutrient needs.

Females have a higher prevalence of hypertension, diabetes, and myocardial infarction than men in jails and prisons (Binswanger et al., 2009). Serving excessive calories hinders improving the hypertension, diabetes, and myocardial infarction prevalence in incarcerated females.

Consuming more than the recommended 2300mg sodium is a significant issue both in the general American diet (USDA, 2020a) and prisons. Lowering sodium intake "is a modifiable risk factor that can help improve blood pressure control and reduce risk of hypertension" (Institute of Medicine 2005, 2005). Because sodium recommendations encompass all genders, sodium from all menus can be analyzed together. Only five prison menus serve less than the recommended 2300mg. All menus regardless of gender provide between 1752mg to 5100mg sodium per day, and an average of 3275 mg.

A necessary dietary component, fiber is beneficial in reducing heart attack and colon cancer risk, and diabetes prevention (Centers for Disease Control and Prevention, 2022a). Based on all prison menus providing an average of 2618 calories, the DGAs recommend consuming at least 36.7g fiber. Prison menus only provide an average of 35.3g fiber, or 1.4g short of the daily recommendations. Refined grains common in prisons are an inferior source of fiber, and prison menus will benefit nutritionally by adding whole grains. Low fruit and vegetable consumption also contributes to inadequate fiber.

Vitamin D offerings from male menus and female menus exceed the recommendations. The state systems providing separate menus may also include beverages fortified with vitamin D therefore hyperinflating the actual Vitamin D offered by food items. Female and male specific menus do not meet DGA recommendations, but also may not include a fortified beverage. Nutrition analyses may not accurately report vitamin D content of food items and therefore not correctly represent menu offerings.

Ideal menu development offers separate menus for each age and gender group according to the DGA daily nutrition or a variety of calorie levels and range from 1800-3000 calories per day by 200 calorie increments. In the case where prisons are unable to provide gendered menus, calorie-controlled menus between 1800-3000 calories incremented by 200 calories are more appropriate than current trends. Again, prisons at minimum should be offering separate menus for males and females.

Vegetable Servings

The DGAs divide vegetables into dark-green; red and orange; beans, peas, lentils; other; and starchy subgroups (USDA, 2020a). Overconsumption of vegetables, especially fresh, is less problematic than overconsumption of overall calories and sodium because vegetables are nutrient-dense. For this reason, proportionally providing the higher end of recommended servings from each vegetable sub-group may be beneficial especially if vegetables replace other foods high in saturated fat, added sugar, and sodium. Table D.1 in Appendix D outlines the recommendations for adults ages 19-59 and 60 and older; total vegetable intake should not include more than 28.6% of starchy vegetables for adults of all ages.

This research analyzes prison menu total and starchy vegetable servings; vegetables offer necessary nutrients, and starchy vegetables are high-calorie low-cost foods common on prison menus. See table 4.3 for actual prison menu vegetable servings. Recommendations suggest starchy vegetables should make up no more than 28.6% of total vegetables consumption. In male-specific prison menus, 30.6% of total vegetable servings are starchy, 28.8% of male and female combined menu vegetables are starchy, and 26.3% of vegetables on female-specific menus are starchy. One possible explanation for male-specific menus offering more starchy

vegetables than female-specific menus is that facilities serving separate menus for males and females usually use similar menus and adjust portion sizes to meet gendered calorie needs. Adjustments to starchy vegetable and refined grain servings allow a kitchen to prepare one menu and serve both males and females and still serve additional calories to males. This practice inflates starchy vegetable servings to males above the DGA recommendations. Accordingly, female, and male and female combined menus do not exceed weekly guideline suggestions.

Fruit Servings

Whole fruit is a nutrient-dense source of fiber. Half of fruit consumption should be consumed as whole fruit as opposed to fruit juice (USDA, 2020a). Fresh fruit servings are heavily scrutinized by security staff because it is a key ingredient in illicit brew of which consumption can lead to altercations between incarcerated individuals and staff (Spalding Walters et al., 2015). If prisons are unable to serve fresh fruit, whole fruit should be available and fruit juice should be limited to less than 50% of fruit offerings.

The average fruit servings on prison menus provide less than DGA recommendations to consume 2 to 2.5 cup-equ fruit per day (USDA, 2020a). Only three of the 43 menus reporting fruit servings served at least the minimum fruit recommendation. One state serves 100% of fruit servings as fruit juice on both the male-specific and female-specific menus. A different state serves 91.1% of fruit servings as juice on the male and female combined menu. All seven of the menus including fruit juice developed by contract RDNs serve over the fruit juice recommendation. Current prison menus require additional whole fruit servings to meet guidelines and provide sufficient nutrients supplied by fruit.

Fortified Beverage Use

Corrections dietitians have not reached a consensus about the use of fortified beverages on prison menus. The Association of Correctional Food Service Affiliates publishes quarterly newsletters with occasional messages directed toward dietitians labeled the "Dietitian's Corner" (Wakeen, 2013). The Spring 2013 article highlighted fortified beverages and recommended usage possibly as an occasional substitute for milk due to rising milk prices. Fortified beverage nutrient content was compared to milk, and a note in parenthesis state that these beverages contain anywhere from one vitamin (vitamin C) and hints beverages may be used when fruit or juice servings are limited. The article does not recommend substituting a fortified beverage in place of fruit. However, Table 4.4 suggests that in states where dietitians' services are contracted and fruit servings are low or nonexistent, fortified beverages are served at various meals.

Use of fortified beverages is not explicitly stated in current literature as ethical or unethical. However, withholding fruit on menus and providing fortified beverages containing similar synthetic nutrients to fruit is inappropriate. Supplements such as a fortified beverage "cannot be replacements for healthy eating" (Duyff, 2017, p. 335). This practice is inconsistent with the DGA recommendations on fruit consumption. Many states whose fruit servings did not meet DGA recommendations also served a fortified beverage, possibly indicating the beverage is used as a substitute for fruit on the menu.

Fortified beverage use is not reviewed in accreditation standards, nor publicly questioned ethically by corrections menu professionals. Vitamin and mineral supplementation may be warranted in certain nutritional situations. However, nutrition science establishes that consuming nutrients from food items is superior to supplements and synthetic vitamins (Duyff, 2017, p. 335). The ethicality of fortified beverage usage should be clearly established before including

these supplements in the nutrition analysis and overall nutritional adequacy review performed by corrections RDNs.

Cycle Length

Foodservice experts suggest that long-term care facilities where residents stay for long periods of time should use three- or four-week cycle menus or longer (Gregoire, 2017). Short cycle menu lengths increase repetition in perpetuity for those with long prison sentences; these menus also increase the risk of inadequate nutrient consumption due to less variety of foods offered. As outlined in Table 4.5, prison menu cycles tend to be rather short in duration and not provide adequate nutrition or too long with similar issues; both the 7-day and 42-day cycle menus did not serve enough fruits or vegetables and offered excessive calories. The three- and four-week cycle menus were nutritionally preferrable to longer or shorter menus. Further investigation from this perspective is warranted.

Conclusions

The average prison menu currently does not meet the DGAs for male and female adults 19 years and older. At least 18 prison systems serve one menu to both males and females. Females make up 7.67% of the prison population, but 52.3% of females receive menus designed for males. Providing a male-centric menu to incarcerated females worsens problematic female weight gain (Clarke & Waring, 2012). To ensure prisons provide appropriate nutrition, prisons should develop separate menus for males and females. Best-practices should be established to apply the DGA calorie recommendations by developing incrimental calorie-controlled diets

starting with an 1800 calorie menu and increasing by 200 calories up to 3000 calories (USDA, 2020a).

Starchy vegetables are offered above DGA recommendations on the average prison menu, and the average total vegetable offerings fall short. Starchy vegetables augment female menus to increase calories to meet male calorie needs, therefore, male-specific menus offer more starchy vegetables than female-specific menus. Twenty-three collected menus served less than the recommended three cup-equ of total vegetables per day, only 17 menus met or exceeded recommendations. Current prison menu vegetable servings are inadequate.

Inadequate fiber consumption is related to low fruit and vegetable intake (Centers for Disease Control and Prevention, 2022a). Only one prison's menu met or exceeded the minimum fruit DGA recommendation. At least eight menus provided fruit juice for more than the recommended maximum 50% of fruit servings, and three menus served fruit juice for more than 90% of fruit servings. One menu serves zero fruit, and instead serves a fortified beverage at every lunch and dinner meal. Use of fortified beverages is not explicitly ethical or unethical, which should be determined by the scientific nutrition community. Fruit servings on prison menus are inadequate.

Implementing appropriate guideline application may meet resistance when only suggested by corrections dietitians. Accrediting organizations requiring menu adequacy should consider enforcing menus developed specifically for each gender or requiring foodservices to make calorie-controlled menus available. Interpreting and applying DGA recommendations based on gender, physical activity, and age to meet the entire state prison population has not shown to yield appropriate menu offerings. Including clear verbiage supporting appropriate application of nutrition guidelines may improve prison menu nutrition.

Limitations

Prison system response rate in this study and subsequent generalizability is a limitation as only 33 states responded to document requests. Only 29 states provided menus, 21 states provided nutrition analyses, and 19 states provided both. At least three menus did not include portion sizes and were not included in fruit and vegetable serving analysis. Some nutrition analyses only provided calories and protein, and most did not provide vitamin D. Thus, it is difficult to generalize these findings to the entire prison population.

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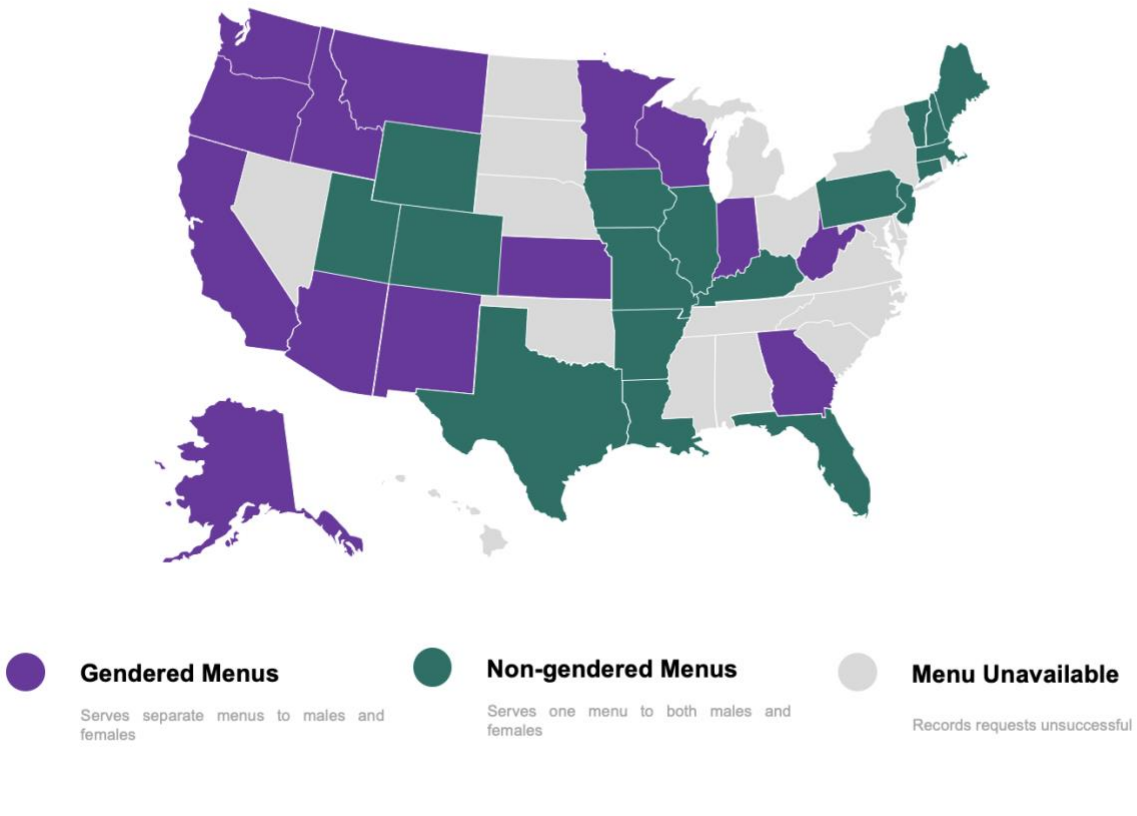
Table 4.1 Types of Menus Served in Prisons (n=93)

Gendered or Default		***Religious***	
Male and Female	18	Kosher	16
Male	16	Vegetarian	13
Female*	15	Vegan	9
Seasonal	4	Halal	7
		Other	6

*one system claimed only to house incarcerated males and did not acknowledge any other department overseeing the care and housing of incarcerated females

Figure 4.1 State Representation of Menus and Analyses Collected



	Total Population
Texas	116,684
California	96,302
Florida	84,797
Georgia	48,907
West Virginia	37,790
Pennsylvania	37,366
Arizona	34,148
Illinois	29,666
Louisiana	27,677
Indiana	23,027
Wisconsin	21,104
Arkansas	17,814
Missouri	15,797
Colorado	15,508
Oregon	12,282
Washington	12,244
Kentucky	10,663
Connecticut	10,035
New Jersey	9,891
Kansas	8,911
Minnesota	8,152
Iowa	8,110
Idaho	6,745
Utah	6,665
Massachusetts	6,070
New Mexico	5,651
Alaska	4,738
Michigan	4,551
Montana	2,752
Wyoming	2,196
New Hampshire	2,000
Maine	1,756
Vermont	1,205
State totals:	**731,204**

See Appendix C for population details

Table 4.2 Average Nutrient Servings vs Recommendations (n=49)

Nutrient	Average	Recommended[a]	Nutrient	Average	Recommended[a]
Calories (kcal)			***Sodium (mg)***		
Male	2820		Male	3701	< 2300
Male and Female	2674		Male and Female	3450	< 2300
Female	2303		Female	3128	< 2300
Protein (g)			***Fiber (g)***		
Male	98.5	70.5 < g > 246.8	Male	33.8	> 39.5
Male and Female	92.9	66.9 < g > 234.0	Male and Female	32.9	> 37.4
Female	82.8	57.6 < g> 201.5	Female	28.6	> 32.2
Carbohydrate (g)			***Vitamin D (IU)***		
Male	395.5	317.3 < g > 458.3	Male	810	> 600
Male and Female	390.5	300.8 < g > 434.5	Male and Female	518	> 600
Female	316.6	259.1 < g > 374.3	Female	864	> 600
Fat (g)			***Vitamin D (mcg)***		
Male	96.7	62.7 < g > 109.7	Male	66.6	> 15
Male and Female	84.1	59.4 < g >104.4	Male and Female	5.70	> 15
Female	76.0	51.2 < g > 89.6	Female	84.9	> 15
Saturated Fat (g)					
Male	26.2	< 31.3			
Male and Female	23.2	< 29.7			
Female	21.9	< 25.6			

[a]USDA, 2020a

Table 4.3 Average Fruit and Vegetable Servings vs Recommendations[a] (n=43)

Vegetable	Average	Recommended	Fruit	Average	Recommended[b]
Starchy Vegetables (cup-equ per week)			***Fresh Fruit (cup-equ per day)***		
Male	6.34	< 5.0	Female	0.85	
Male and Female	5.51	< 5.0	Male	0.77	
Female	4.84	< 5.0	Male and Female	0.52	
Total Vegetables (cup-equ per day)			***Total Fruit (cup-equ per day)***		
Male	2.96	>= 3.5	Female	1.25	2.0
Male and Female	2.73	>= 3.5	Male	1.22	2.5
Female	2.63	>= 3.0	Male and Female	1.30	2.0

[a]USDA, 2020a

[b]Fresh fruit was examined in this research but not recommended as a sub-group in DGAs

Table 4.4 Fruit Offerings Compared to Fortified Beverage Use (n=18)

	Fortified Beverage Menu Frequency		
Fruit Offerings (cup-equ per day)	**Breakfast**	**Lunch**	**Dinner**
3.24	-	-	every
3.00	every	every	every
1.96	-	every	-
1.93	-	most	most
1.87	every	every	every
1.74	-	every	-
1.41	-	every	every
1.21	every	every	-
1.17	every	every	every
0.96	-	every	-
0.67	every	every	every
0.64	every	-	-
0.64	-	every	-
0.64	-	some	some
0.50	every	every	every
0.50	-	every	every
0.23	every	every	every
0.00	-	every	every

Table 4.5 Cycle Length and Average Nutrition Content by Gendered Menu Type (n=45)

	Cycle Length (days)	Number of Menus Given Cycle Length	Fruit Servings (cup-equ/day)	Vegetable Servings (cup-equ/day)	Calories (kcal/day)	Protein (g/day)	Carbohydrate (g/day)	Fat (g/day)	Fiber (g/day)	Sodium (mg/day)
Male	7	1	0	2.61	3161	87.7	437.3	116.8	n/p	n/p
Female	21	1	1.98	3.38	2220	103.4	270.4	85.5	28.1	2868
Male	21	2	1.78	3.34	2700	113.3	364.1	93.5	33.2	3385
Male and Female	21	1	0.95	1.72	2837	n/p	385.9	89.3	33.1	3517
Female	28	6	1.62	2.53	2153	81.9	303.3	74.1	29.4	2913
Male	28	7	1.59	3.02	2747	101.3	385.5	94.3	36.4	3700
Male and Female	28	9	1.54	2.79	2672	90.7	399.9	84	34.5	3372
Male and Female	31	1	0.49	3.06	n/p	n/p	n/p	n/p	n/p	n/p
Female	35	4	0.95	2.77	2575	88.8	358.8	77.5	28.4	3522
Male	35	3	0.96	3.14	2965	97.6	426	97.9	30.8	3983
Male and Female	35	2	1.31	2.5	2025	93	285	59	n/p	2417
Female	42	1	0.23	1.7	2200	50	n/p	73.3	25	3500
Male	42	1	0.23	1.73	2800	63	n/p	96.6	25	3500
Male and Female	42	5	0.95	0.93	2998	97.3	462.8	n/p	n/p	n/p
Female	56	1	n/p	n/p	2007	n/p	n/p	n/p	n/p	n/p

n/p = not provided
Rows are an average of each gendered menu given cycle length

Chapter 5 - Survey Response Findings

Introduction

Prison menu development lacks sufficient structure and guidance. The voluntary National Commission on Correctional Health Care (NCCHC) and American Correctional Association (ACA) accreditation standards suggest that a registered dietitian nutritionist (RDN) should review menus annually for nutritional adequacy (NCCHC, 2022; ACA, 2021). RDNs are qualified to determine which nutritional guidelines to follow and how to apply guidelines to the diverse prison population demographics in a one-size-fits-all menu. In prison systems where RDNs recommendations influence menu decisions, ambiguous guidelines may suffice; uncooperative foodservice systems conceivably benefit from clear guidelines. State systems either employ RDNs or contract with RDNs to provide nutritional certification. The relationship between the menu nutritional value and whether prisons contract with RDNs is unclear and unresearched. Contract dietitians face similar challenges determining nutritional adequacy.

Some state prison systems contract with RDNs to review menus for nutritional adequacy. Prevention from a litigious incarcerated population (Gunderson, 2022) possibly claiming carelessness caused by inappropriate menu development may passively incentivize prisons to employ an RDN to certify menus as nutritionally adequate. Prisons accommodate individuals with various health conditions, ages, physical activity levels, and commitments to healthy lifestyles. These factors influence appropriate nutrition recommendations, thus confounding determining appropriate nutrition guidelines for a one-size-fits-all menu development approach.

The Dietary Guidelines for Americans (DGAs) outline healthy lifestyle habits specific to various stages of life and circumstance (USDA, 2020a). Prison systems provide necessities for individuals in various stages of life leaving inconclusive dietary recommendations to meet each

person's needs. Best practices for corrections menu development have not been established. Therefore, the researchers investigated current practices among corrections RDNs to understand menu development practices.

This chapter considers the RDNs role relating to the menu and relationship between corrections' organizational factors and nutrition offerings. State systems either employ RDNs or contract with RDNs in diverse ways to provide nutritional certification. Collaboration or lack thereof between RDNs and foodservice departments may be related to how adherent actual meals are to the approved menu. Depending on the prison's organizational structure, the RDN may have more or less influence on menu decisions and accommodations. For example, a dietitian employed by the foodservice department may access foodservice personnel more frequently than a dietitian employed by a medical department. Previous research is unclear whether menu nutrition is influenced by these or other organizational factors. However, the absence of menu development uniformity may relate to inconsistent or inadequate menu offerings.

Methodology

Data Collection

A survey for correctional RDNs was developed by researchers and administered by Qualtrics (Provo, UT). The survey included questions related to menu development and organizational structure. Kansas State University's Institutional Review Board determined this research proposal was exempt from further review on March 3, 2023; and Institutional Review Board protocol was followed. Qualtrics-generated survey links in emails distributed to email addresses that the researcher entered. Four non-RDN corrections professionals participated in the survey because RDNs were not available. The only survey question requiring a response was

whether the participant was a correctional dietitian. All other questions did not require responses for survey completion, and some survey analysis data reflects fewer responses than total participants.

The total number of correctional RDNs in state prison systems is unknown. Each state presumably hires or contracts with a dietitian. At least six states employ more than one RDN; one contract RDN reported being assigned to a geographic region of more than one state. The total possible population of corrections RDNs likely contains more than 50 dietitians, but probably not more than 100 dietitians. Researchers obtained contact information for 34 corrections professionals and emailed a survey link for each to participate; only 24 corrections professionals in 20 prison systems completed the survey.

Many obstacles prevented researchers from obtaining contact RDN information. Arkansas, Delaware, Hawaii, and Pennsylvania were actively recruiting for RDNs with job postings available online. California's system was so large that neither the main office nor records department could provide contact information for any dietitians working with menus. The Alabama RDN started in her position three months before researchers contacted her and declined participation to avoid putting her job in jeopardy. At least 15 states contract for RDN services, and contract RDNs were less accessible and more difficult to contact than state-employed RDNs. Not all state prisons have access to the contracted RDNs and therefore could not provide contact information. For example, some contract companies hire multiple dietitians assigned to geographic regions, and one RDN is not assigned to one state's prison system. One state provided the contract company point of contact person's information, but the point of contact never responded to researcher's inquiries.

A few dietitians responded to an initial email inquiry through the Dietitians in Health Care Communities Corrections Sub-unit Dietetic Practice Group listserv requesting responses if members currently review prison menus. Researchers contacted RDNs registered with the Association of Correctional Food Service Affiliates in an attempt to locate current state correctional dietitians, however, all of the dietitians contacted were retired or worked with county facilities.

Twenty-five states required a research application prior to connecting researchers with RDNs. Applications required survey item review in a .pdf format. Although the survey was administered electronically, five research units provided responses on the .pdf copy sent with the research application. Three research units required the survey invitation include state research staff copied on the email.

Michigan, Oregon, Texas, and West Virginia required research applications before including RDNs in the survey, and these states rejected the applications because the respective research departments were at capacity supporting other research projects. Upon further inquiry, the research units agreed that menu documentation is available through the public records process, but the research departments were unable to provide any direction on that process. Research units in these states did not encourage RDN survey completion.

The Texas Department of Criminal Justice provides application forms on their website to submit to the Research and Development Department Director. Texas requires researchers to submit personal information for a background check prior to application review. The documents on the website are outdated, and similar forms requiring social security numbers, photo of a driver's license, birthday, and home address for each person with access to the data was received upon application submission; researchers provided this personal information twice. More than

five weeks later and after a reminder email, Texas responded that the research application was declined.

A few research units were unresponsive despite frequent attempts to ask questions and submit applications. For example, the South Carolina Department of Corrections requires a research application, but documents and research unit contact information were difficult to find on the website. The main prison phone number directed research requests to the research unit who then instructed that all further communication should route through the Ombudsman who forwards the research inquiries to the research unit. Each follow-up email received a confirmation receipt and noted the email was forwarded to the correct department. It is unclear if the research application was received, reviewed, or approved after 4 emails between March 15 and June 1, 2023. Mississippi, Nebraska, New York, Rhode Island, South Dakota, and Tennessee's Departments of Corrections generated similar barriers in applying to conduct research.

In some cases, the research units in prison systems requiring an application for this research were very supportive and informative. The Illinois research unit was responsive to questions and approved the research application within two weeks of submission. The research unit representative from the Indiana Department of Corrections (DOC) provided regular updates about the application review. Indiana contracts with RDNs for menu review, but the research representative helped direct researchers to the contract RDN who completed the survey.

Contracting with RDNs and foodservices produces unique challenges in requesting data. For example, although the Illinois research unit was helpful during the research application process, the contracted RDN is not required to follow the same guidelines as the Department of Corrections. A few research units assisted with menu and analysis collection and provided

contract RDN contact information. However, survey participation was subject to the contract management company's discretion and direction. Similar barriers were experienced with other states and contract RDNs.

Together, researchers obtained contact information for 34 dietitians representing 27 states. Many unrepresented states presumably contract with RDNs and were either unwilling or unable to provide information for the contract RDN reviewing menus. Although researchers identified a few dietitians prior to research application approval, some RDNs declined survey participation until after review process completion. Five dietitians received survey invitations and then quit communication without survey completion. At least eight states employ more than one dietitian, therefore, multiple RDN survey responses represented the same state prison system. A few states also employ Nutrition and Dietetics Technicians, Registered (NDTR), which is a different certification than an RDN; one NDTR completed the survey. In total, 24 completed surveys were recorded.

Data Analysis

Survey items targeted two research questions:

1. How does the RDN's role relate to the menu?
2. What is the relationship between corrections' organizational factors and nutrition offerings?

Survey response descriptive statistics provide insight on correctional dietitians. Because the total population of corrections RDNs is unknown and assumed to be less than 100, inferential statistical calculations were not performed. However, data presented in this chapter analyzes

corrections nutrition offerings and reveals opportunities for research to build on this work to enable policymakers and prison administrators to develop informed policy.

Results

Corrections Dietitians

Of the 24 survey participants, 20 were correctional RDNs; four participants were not RDNs and described their titles as foodservice director, dietetic technician, foodservice program manager, and dietary services manager. See Figure 5.1 for a visual representation of the prison systems represented by survey responses. Twenty participants reported to have worked in corrections for five or more years and 18 reported working in the current prison system five or more years. Only one respondent worked in corrections and his or her current system less than one year. Three participants worked in his or her current system 2-5 years, and two had worked in corrections 2-5 years. Only two survey participants contracted hourly with DOCs. Majority, or 21 participants were employed full-time, and zero were employed part-time.

Insert Figure 5.1

Survey responses represent 20 prison systems. At least 12 survey responses indicated his or her DOC only employed one RDN. Two states that employed multiple dietitians are also represented by more than one survey response. Ten survey responses indicated that multiple RDNs work for the system where the survey participant worked. Some large prison systems use dedicated medical facilities to house and treat incarcerated persons with advanced medical needs

and hire RDNs to treat nutritional issues in these facilities. Nine survey responses indicated use of a medical facility. Six responses indicated these systems employ RDNs dedicated to medical facilities; ten survey responses indicated RDNs are not hired specifically for these facilities.

Educational backgrounds vary between corrections menu professionals. One participant earned a doctoral degree, 11 participants earned master's degrees, three participants completed some graduate coursework, and eight participants completed baccalaureate degrees. At the time of data collection, the Commission on Dietetic Registration required a baccalaureate degree for eligibility to take the RDN credentialing exam (Academy of Nutrition and Dietetics, n.d., "What Is a Registered Dietitian Nutritionist").

Contract Services

At least 15 states contract with dietitians to complete menu reviews. Contracting appears incongruous between states. Not all states responded to researchers' inquiries to locate RDNs, therefore, additional state DOCs may contract for RDN services but are not included in this analysis. Kansas, Nebraska, and Rhode Island contract for RDN services, however, researchers were unsuccessful determining with whom these states contract.

Alaska, Maine, Louisiana, and Wyoming's RDNs self-contract directly with the DOCs, not through a contract agency but RDNs are not state employees. Researchers unsuccessfully located Alaska and Wyoming's RDNs and were unable to extend survey participation invitations to these RDNs. Dietitians contracting with Maine and Louisiana assisted in data collection and readily completed the survey. Both dietitians also contract with county jails and enthusiastically shared contrasting experiences between jails and prisons.

Aramark created a division dedicated to correctional services which include RDN services (Aramark Correctional Facilities, 2022). Florida, Indiana, Kentucky, South Dakota, and West Virginia DOCs noted RDNs provide menus and nutrition analyses as part of their contract with Aramark. None of these Aramark dietitians responded to survey invitation requests.

Trinity Services Group, Inc. also offers contract foodservices in corrections facilities with whom Arizona and Vermont DOCs contract RDN services (Trinity Services Group, Inc, 2023). Although researchers contacted Trinity representatives, representatives did not respond. One Trinity dietitian's email address was obtained, and a survey invitation was extended; however, the survey was never completed. Vermont was unable to provide contact information for the Trinity RDN providing menu reviews.

Data collected in this research provides insight into the relationship between states whose menus include a fortified beverage, fruits served, and contract status (see Table 5.1). Only two of the 18 states using fortified beverages also provide sufficient fruit; nine states serve less than 1 cup-equ fruit per day which is less than half of recommendations. Ten of the 18 states also contract with RDNs. Of the 15 states contracting for RDN services, all but one state's menu regularly includes a fortified beverage; the other four states contracting with a dietitian did not provide menus or nutrition analyses for this research.

Insert Table 5.1

Average total fruit servings on contract menus only provide 0.8 cup-equ where average of all prison menus provide 1.26 cup-equ fruit per day; both averages are less than recommended two cup-equ fruit per day. Contract menus only provide an average of 2.5 cup-equ total vegetables per day, and average of all prison menus provide 2.77 cup-equ per day; both averages serve less than the 3.5 cups recommended by the DGAs. Average sodium provided by contracted menus is 3857 mg per day, higher than the average 3403 mg sodium per day served from all prison menus; sodium provided by both contract and overall prison menus is 1.2 times higher than the 2300 mg per day recommended the DGAs. All but one contract menu serves a fortified beverage. Table 5.2 displays male, female, and male and female menus with key nutrition information provided by states contracting for dietitian services, arranged in ascending order by calorie level of which female menus should offer the lowest amount.

Insert Table 5.2

Correctional Foodservice Management

Most corrections RDNs (13 of 24 survey participants) reported working in the Administrative, Clinical, or Medical Bureau; nine worked in the Foodservices Department; two worked for an external contract management company. Fifteen of the 24 participants do not work in the same department as the foodservice personnel. All but two DOCs employ foodservice staff indicated by survey responses. Only four participants noted an external contract company

manages foodservice staff, more than two RDNs who report to an external contract company in survey responses.

Dietitians are not commonly employed as foodservice directors in state prisons as only RDNs in Missouri and Minnesota have dual titles. Although not foodservice directors, the following positions include a management title:

- Idaho: Dietary Services Manager
- Iowa: Administrator of Dietetics and Nutrition
- New York: Senior Executive Director of Nutritional Services
- Wisconsin: Dietetics Services Director

Survey responses indicate that 14 foodservice directors are civilians with culinary experience, five are RDNs, five are officers with culinary or hospitality experience, three have other experience or qualifications, and two are officers with security experience; some foodservice directors have multiple qualifications for their position. Other qualifications described as contractor with foodservice experience, dietetic services director for the entire DOC, and Certified Dietary Manager with a bachelor's degree in nutrition and metabolism also served as foodservice directors. Basic nutrition knowledge is not a required qualification in corrections or the foodservice industry to prove qualified for a foodservice director position.

Other Organizational Factors

RDNs may turn to professional associations with other corrections dietitians for guidance and current practices. The Academy of Nutrition and Dietetics Dietitians in Health Care Communities practice group Corrections Sub-unit, NCCHC, Association of Correctional Food Service Affiliates, and ACA provide professional networking communities for corrections

professionals including RDNs. Encouraging and support affiliate membership helps bridge the training gap for corrections RDNs. Only eight out of 20 corrections RDNs reported their employer encouraged membership in affiliate groups. Perceived DOC encouragement for RDNs to participate in professional associations is shown in Table 5.3.

Insert Table 5.3

Menu cost information was only available to 13 of the 23 corrections menu professionals, some of which are RDNs, and some are not. All participants agreed that food cost is important in menu changes and updates. Nutrition is almost as important as cost to prison administration during menu development; six RDNs disagreed and nine agreed that nutrition is a primary driver of menu changes and updates, five RDNs were neutral about nutrition as a driver. See Table 5.3 for survey responses comparing nutrition and cost as primary menu drivers. Finding a balance between nutritional adequacy and cost can be challenging if prison administration and foodservice are more concerned about budget constraints. Given cost challenges, 19 out of 20 of participants agreed that prison menus met the nutrition needs of the intended prison population.

Menu Development Practices

All but one dietitian reported their job descriptions outline duties included menu development. Twelve RDNs strongly agreed and seven somewhat agreed and seven somewhat agreed that the RDN job description involves some degree of menu development. Table 5.4

reports the degree to which survey participants agree or disagree with statements regarding menu development practices. Menu review frequency is reportedly clearer in policies and procedures (19 out of 20 RDNs strongly agree and one strongly disagrees) than in RDN job descriptions (16 RDNs strongly agree and two strongly disagree). Only two out of 20 dietitians determined that the process for reviewing menus was not clear, majority of dietitians (12 out of 20) felt this process is clear. Dietitians reporting foodservices willingness to follow recommendation were divided with 13 reporting foodservices follow recommendations and five reporting foodservices do not follow RDN recommendations.

Insert Table 5.4

Survey responses asking which types of master menus are available in each prison system closely resemble the findings from menu and nutrition analysis (chapter 4). Both the survey and records requests yielded 16 menus developed and served specifically to males. Survey responses indicated that 14 states serve female menus, 15 records requests indicate female-specific menus. Only 10 survey responses reflect one menu served both to males and females, and 18 records request reflected one menu served to males and females. See Table 5.5 for a side-by-side comparison.

Insert Table 5.5

Nutritional Adequacy Determinations

Survey participants were asked which guidelines RDNs use when reviewing menus for nutritional adequacy. RDNs were asked to select the three most commonly used guidelines, therefore the responses total more than the 20 RDNs responding. The most common guidelines used were the DGAs (19 responses), Dietary Reference Intakes (18 responses), and MyPlate.gov (nine responses). Table 5.6 provides an overview of how frequently each science-based guideline is compared to in determining nutritional adequacy.

Insert Table 5.6

Five responses indicated using some type of "other" guideline which include RDA/DRI, none, or ACA guidelines. The ACA handbook does not detail nutrition guidelines (ACA, 2021); it is unclear how this review is conducted and what nutrition offerings are compared against. Two "other" responses included references to local governing guidelines. One referenced general state or governing agency requirements, and the other referenced a Department of Inspections and Appeals. National guidelines detailing corrections menu nutrition requirements are not currently developed or enforced.

Most DOCs provide nutrition analysis software for RDNs to calculate master menu nutrient components. Fifteen out of 20 RDN's employers provide custom software, three provide NutritionistPro™, and one provides Computrition, Inc software. One survey participant reported

not having any nutrition software available to conduct a nutrition analysis; it is unclear how nutritional adequacy is determined without reviewing macro- and micronutrient menu offerings.

Discussion

Corrections Dietitians

Because at least four DOCs were actively recruiting RDNs during data collection, it is unclear if states who are not represented by survey responses struggle with RDN turnover. Possibly, these trends indicate that correctional nutrition professionals primarily remain in positions either short-term or long-term, not much in between. High turnover perpetuates inconsistencies within and between prison systems.

Dietitians receive nutrition and menu planning education during university coursework. The Accreditation Council for Education in Nutrition and Dietetics requirements for didactic program accreditation does not include extensive corrections-specific training (Academy of Nutrition and Dietetics, n.d., "What Is a Registered Dietitian Nutritionist"). Educational opportunities providing certifications verifying corrections dietitians are specialized in prison menu development have not been developed. The RDNs approving prison menus must appropriately estimate nutrition needs for the diverse prison populations by applying corrections context to didactic coursework concepts. These nutrition professionals are most appropriate for prison menu nutrition approval, and suitable guidelines for menu comparison will improve prison menu development practices.

Contract Services

Given RDN turnover, contracting for RDN services benefits state systems struggling to recruit dietitians. Contract dietitians obtain the same level of education as state-employed dietitians. However, nutrition content served in prison systems contracting with dietitians is subpar as outlined in Table 5.2.

Three states which contract for RDN services did not provide menus or nutrition analyses upon records requests. Each of these states' records departments ignored 12 weeks of persistent requests for documents. Although a contract company's records do not apply to government transparency laws, state prison foodservice departments obtain menu copies, and state copies should be made available under these laws.

Contracting with RDNs or foodservice companies creates barriers given the structural arrangement. For example, a contract dietitian concerned about adequate nutrition may provide recommendations to foodservice staff to increase fruit or vegetable servings, substitute refined grains for whole grains, or reduce dessert frequency. However, the RDN may not be able to confirm adherence to recommendations. After providing nutrition certification indicating menu adequacy, enforcement becomes difficult when dietitians work offsite and do not have access to corrections or foodservice facilities. Recommendations are not likely implemented.

State prison systems contracting for RDN services and foodservices need to be specific about nutrition requirements prior to menu implementation. Paying a contract company to provide inferior nutrition to the incarcerated population may become a detriment to medical costs. Contract RDN and foodservice company menus should at least be held to the DGA recommendations, and prison contract administrators should scrutinize menu offerings and

nutrition analyses. The corrections industry should review whether employing contract services in foodservice departments is ethical given the nutritionally inadequate state of contract menus.

Correctional Foodservice Management

Survey questions inquired which department dietitians report to, how many dietitians are employed in each prison system, and about interactions between the dietitian and foodservices. These questions provide insight on the influence RDNs have on menu development and approval. Dietitians' job titles include manager or director in six states suggesting these RDNs are in a position of authority which may or may not include authority to nutrition decisions.

Nine out of 24 survey responses indicated correctional dietitians work in the foodservices department. A dietitian's direct proximity to foodservice management and staff presumably increases access and influence, although this relationship should be included in future research. Thirteen RDNs work in administration, clinical, or medical departments, or are contracted. Dietitians working in the foodservice department and are more likely to be involved in menu development than dietitians who work in other areas. Nutrition education is not a required qualification when hiring correctional foodservice directors as indicated by survey responses inquiring about foodservice director qualifications. Nutrition experts ensuring menu nutritional adequacy are essential for a vulnerable and long-term incarcerated population.

Other Organizational Factors

Survey responses suggest turnover among corrections dietitians, especially considering five states were recruiting during data collection. Without correctional RDN mentors, RDN-specific training, or overlap between incoming and outgoing dietitians, newly hired dietitians

receive general onboarding specific to that prison system, but not specific to corrections dietitians. This nonspecialized training lends to confusion and menu inconsistency between prison systems.

Professional associations provide mentorship and training between the community of corrections dietitians. Although not antagonistic, DOCs do not provide or explicitly support professional association membership opportunities. When prison systems only hire one RDN, the value of professional associations may not be realized. Newly hired correctional dietitians without RDN mentors may be unaware of professional associations targeting with RDN-focused groups. Employer-funded professional development is not required during employment, and membership costs are a deterrent when RDNs finance these fees.

Minimal RDN training is especially problematic in corrections systems where menu items are scrutinized by security staff and prison administration. Food items deemed acceptable to the general population may not be appropriate on prison menus. Dietitians new to corrections may not be aware of these issues when engaging in menu development.

Survey responses indicate that cost may be a more important factor in menu development than nutrition. Menu developers' nutrition knowledge may not support nutritionally advantageous decisions when considering cost, which is especially problematic when RDNs are not involved in menu development. One possible indication of this is that RDNs may recommend nutritionally appropriate items on menus and foodservice staff may substitute foods of lesser nutritional value to save on food cost. Another indicator is blatant disregard or exclusion for RDN recommendations and menu development skills evidenced by antagonistic relationships between RDNs and foodservice staff.

Survey responses report that most dietitians do not have access to menu cost information; therefore, dietitians may not be privy to changing food prices. Foodservices may need to make menu adjustments to operate within their budget. Barriers between foodservices and dietitians discourage foodservices from seeking RDN input on menu changes. Dietitians cannot adequately gauge menu nutrition without foodservices informing the RDN when menu adjustments are made.

Current research does not address foodservice adherence to prison menus and implications that adherence or lack thereof have on overall menu nutrition. What is outlined on menus may not reflect what is actually served on trays, even if foodservice directors and dietitians previously agreed on menu offerings. Corrections dietitians must establish best practices to manage menu substitutions. For example, dietitians may provide a list of approved menu substitutions to foodservices. Substituting one starchy vegetable for another may not require RDN input, but substituting a hamburger patty for fried rice should involve the RDN. Dietitians outlining appropriate like-for-like substitutions for common menu items may also notice increased adherence to menus.

Menu Development Practices

Each prison system determines which master menus are available. Population size may influence whether one menu is served to males and females or separate gendered menus; administration may determine that the number of females in their system does not warrant development of a female-specific menu. Dietary religious observances factor into menu accommodations and which types of menus are designed to meet religious requirements.

Master menu terminology is inconsistent across prison systems. The survey asked corrections menu professionals to report which master menus are available in the prison system he or she works in. A few participants incorrectly included medical diets with master menus. NCCHC distinguishes between medical diets and master menus; standard P-D-05 outlines medical diet requirements and standard P-B-01 provides suggestions for general (or master) menus (NCCHC, 2022, pp. 77 and 29). Corrections RDNs with limited formal corrections or on-the-job training likely learn the difference between medical and master menus on their own.

Survey responses reflected fewer menus served both to males and females than records requests yielded due to participation rate. Similar findings from records request and survey responses validate overall menu-type trends for gendered and religious menus. Both data collection sources show more than one third of states serve the same menu to incarcerated males and females. The survey responses reflect more age-based menus than from records requests; specifications requesting from prison systems may not have been clear enough for records departments to provide these menus. Dietitians may also not recognize "other" religious menus as master menus; thus, they were not provided with records requests. Consistency in terminology will benefit religious menu availability and support dietitian collaboration and establishment of corrections menu best practices.

Nutritional Adequacy Determinations

The most frequent guidelines correctional dietitians use to determine nutritional adequacy are the Dietary Guidelines for Americans, MyPlate.gov, and the Dietary Reference Intakes. MyPlate.gov is a practical application of the DGAs and therefore could be included in the top two guidelines used during menu reviews. Guideline application is inconsistent and inappropriate

in some prison systems. Some dietitians apply the average population demographics to nutrition guidelines, and others perpetuate guidelines determined by previous dietitians not knowing which guidelines were used. Many menus overestimate calorie needs, possibly to accommodate as many taste palates as possible. About 52.9% of menus estimate nutrition needs for males and provide that menu to females. The DGAs may be the most common guideline followed, but dietitians are unclear on how to apply those guidelines to meet the needs of the entire prison population as explained in Chapter 4.

Two survey responses noted outside regulation or guidelines detailing nutrition requirements for state prison menus. This research did not stratify states based on population size or geographic location. These divisions would be inappropriate as state governments are subject to decisions within each circuit court.

As most states have not adopted legislation regarding prison menus, the DGAs are the most prevalent determination of nutritional adequacy. One RDN's survey response indicated that the most recent menu review was determined as nutritionally inadequate, which is a major cause for concern. Menu reviews are not publicly available for review without requesting through federal Freedom of Information Act processes; most reviews are stored in RDN files and accreditation review materials.

The most appropriate recommendation is to provide calorie-controlled master menus regardless of gender to reflect DGAs for age, gender, and physical activity. Until appropriate guidelines are developed, providing separate menus for males and females is more suitable than current practices to offer one menu to the entire prison population. Serving one menu to both genders should be eradicated from correctional menu development practices.

Conclusions

Dietitians are a required and essential part of the prison menu development and accreditation process. RDNs receive formal nutrition and menu planning training, however, corrections-specific understanding is learned on the job. Turnover and limited dietitian-specific on-the-job training coupled with employer-unsupported professional communities leave dietitians learning by trial and error. Prison menus suffer the consequences as evidenced by inadequate nutrition offerings.

Organizational factors related to menu development may exacerbate the prison system's ability to provide appropriate menu nutrition. Employing correctional RDNs in separate departments than foodservice staff may create unintentional barriers and limit communication about menu offerings. Excluding dietitians from foodservice and menu management perpetuates inappropriate menu substitutions and undermines menu adherence. Hiring multiple dietitians emphasizes nutrition in menu decisions and allows dietitians to provide expertise in both foodservice and medical processes. The dichotomy between RDN job descriptions and actual responsibilities regarding menu development practices highlights a major issue behind inadequate prison menu offerings.

Clearly dietitians refer to the DGA recommendations when reviewing prison menus for nutritional adequacy. However, corrections nutrition guidelines outlining how to apply nutrition recommendations are warranted. Even though the DGAs lay the groundwork for appropriate menu offerings, the inconsistency in applying guidelines reveals that dietitians need further guidance on best practices for developing corrections menus. This research calls on the corrections industry to develop guidelines and best practices for prison menus.

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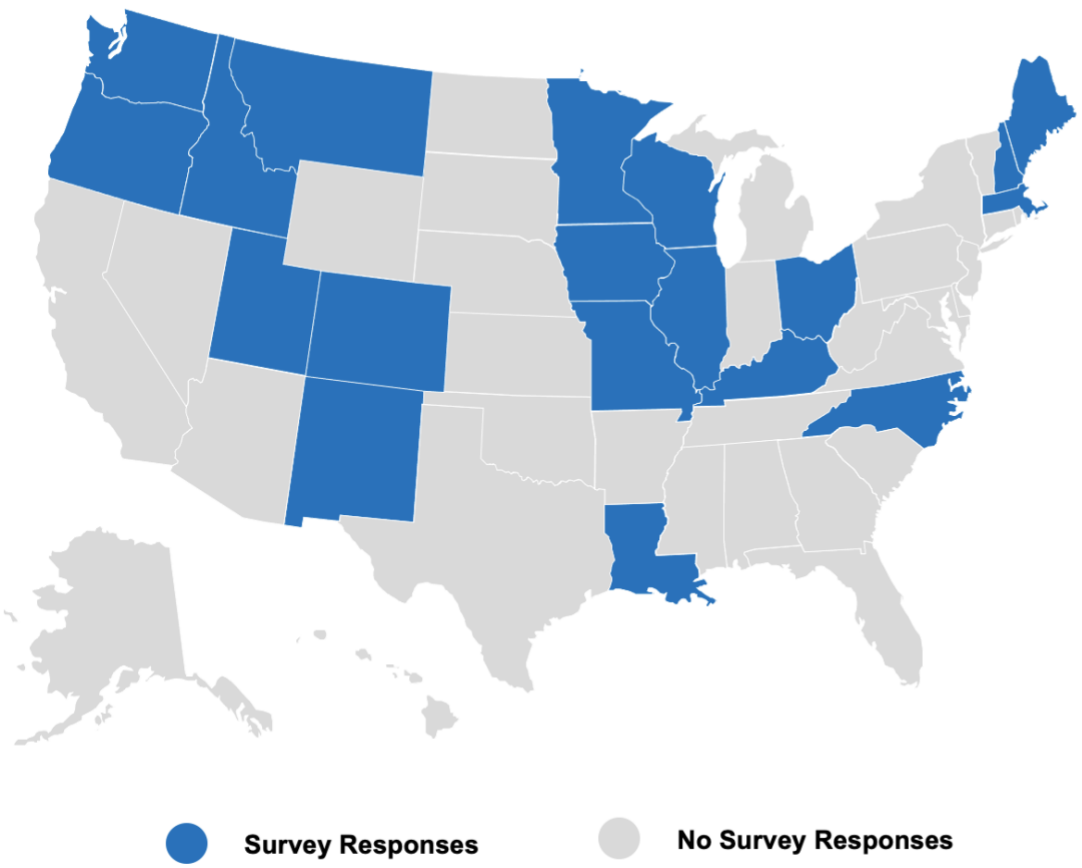
Figure 5.1 State Representation by Survey Responses



Prison Population Represented by Survey Responses

	Total Population
Ohio	44,169
North Carolina	30,766
Illinois	29,666
Louisiana	27,677
Wisconsin	21,104
Missouri	15,797
Colorado	15,508
Oregon	12,282
Washington	12,244
Kentucky	10,663
Minnesota	8,152
Iowa	8,110
Idaho	6,745
Utah	6,665
Massachusetts	6,070
New Mexico	5,651
Montana	2,752
New Hampshire	2,000
Maine	1,756
	267,777

See Appendix C for population details

Table 5.1 Contract Services Compared to Fruit Offerings and Fortified Beverage Use (n=18)

		Fortified Beverage Menu Frequency		
Contract for RDN Services*	**Fruit Offerings (cup-equ per day)**	**Breakfast**	**Lunch**	**Dinner**
Trinity	3.24	-	-	every
-	3.00	every	every	every
-	1.96	-	every	-
-	1.93	-	most	most
-	1.87	every	every	every
-	1.74	-	every	-
-	1.41	-	every	every
-	1.21	every	every	
self-contract	1.17	every	every	every
self-contract	0.96	-	every	
self-contract	0.67	every	every	every
Aramark	0.64	every	-	-
contract	0.64	-	every	-
-	0.64	-	some	some
Aramark	0.50	every	every	every
Aramark	0.50	-	every	every
Trinity	0.23	every	every	every
Summit	0.00	-	every	every

*DOC names are not included to avoid censorship in reporting data

Table 5.2 Menus Developed by Contract RDN Services (n=19)

	Contract Type	Fortified Beverage Usage	Calories (kcal/day)	Sodium (mg/day)	Fiber (g/day)	Fresh Fruit (cup-equ/day)	Fruit Juice (% of Total Fruit)	Total Fruit (cup-equ/day)	Starchy Vegetables (cup-equ/day)	Total Vegetables (cup-equ/day)
Female	Trinity Services Group, Inc.	yes	2200	3500	25	0.14	0%	0.23	0.38	1.7
Female	Aramark	yes	2300	2924	26.9	0.25	50%*	0.5	0.83	2.07
Female	n/p	yes	2387	3421	26.4	0.26	60.0%	0.64	0.55	2.4
Male	Aramark	yes	2580	3259	29.9	0.25	50%*	0.5	1	2.35
Male	Trinity Services Group, Inc.	yes	2800	3500	25	0.14	0%	0.23	0.38	1.73
Male and Female	Aramark	yes	2815	4012	31.3	0.29	55.6%	0.64	0.8	2.72
Female	Aramark	yes	2834	4326	25.2	0	100%	0.5	1.07	2.61
Female	RDN Self-contract	yes	2871	n/p	n/p	0.46	0%	0.9	0.85	2.21
Male	n/p	yes	2915	3849	27.2	0.29	56.6%	0.64	0.79	2.47
Male	RDN Self-contract	yes	2960	5100	n/p	0.68	0%	1.43	0.79	2.76
Male and Female	RDN Self-contract	no	2998	n/p	n/p	0	91.1%	0.47	0.74	1.76
Male and Female	Summit Food Service, LLC	yes	3161	n/p	n/p	0	0%	0	0.79	2.61

n/p = not provided

Table 5.2 Menus Developed by Contract RDN Services (n=19) (cont'd)

	Contract Type	Fortified Beverage Usage	Calories (kcal/day)	Sodium (mg/day)	Fiber (g/day)	Fresh Fruit (cup-equ/day)	Fruit Juice (% of Total Fruit)	Total Fruit (cup-equ/day)	Starchy Vegetables (cup-equ/day)	Total Vegetables (cup-equ/day)
Male	Aramark	yes	3207	4677	26.9	0	100%	0.5	1.33	2.94
Male and Female	RDN Self-contract	yes	n/p	n/p	n/p	0.33	33%**	0.67	1.08	3.27
Male and Female	n/p	n/p	n/p	n/p	n/p	n/p	n/p	n/p	n/p	n/p
Male and Female	n/p	n/p	n/p	n/p	n/p	n/p	n/p	n/p	n/p	n/p
Male and Female	Aramark	n/p	n/p	n/p	n/p	n/p	n/p	n/p	n/p	n/p
Male and Female	Trinity Services Group, Inc.	yes	n/p	n/p	n/p	0.8	0%	3.24	0.56	3.17
Male and Female	RDN Self-contract	yes	n/p	n/p	n/p	0.12	65.4%	0.96	0.55	2.54

n/p = not provided

Table 5.3 Organizational Factors to RDN Success in Menu Development (n=20)

Survey Item	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
American Correctional Association (ACA) accreditation process includes input from the RDN.	2 (10%)	0 (0%)	10 (50%)	6 (30%)	2 (10%)
National Commission on Correctional Health Care (NCCHC) accreditation process includes input from the RDN.	2 (10%)	1 (5%)	11 (55%)	3 (15%)	3 (15%)
Membership in affiliate groups for corrections RDNs (such as ACFSA, DHCC DPG, etc.) is encouraged by RDN employer.	2 (10%)	4 (20%)	6 (30%)	2 (10%)	6 (30%)
The master menu(s) meet the nutritional needs of the inmate population.	1 (5%)	0 (0%)	0 (0%)	8 (40%)	11 (55%)
Food cost is the primary driver of menu changes and updates.	0 (0%)	0 (0%)	3 (15%)	8 (40%)	9 (45%)
Nutrition is the primary driver of menu changes and updates	2 (10%)	4 (20%)	5 (25%)	5 (25%)	4 (20%)

Table 5.4 RDN Menu Development Role (n=20)

Survey Item	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
RDN is primarily responsible for menu development.	2 (10%)	2 (10%)	0 (0%)	3 (15%)	13 (65%)
RDN job description outlines duties related to menu development.	1 (5%)	0 (0%)	0 (0%)	7 (35%)	12 (60%)
Menu review frequency (annually, bi-annually, etc.) is made clear in RDN job description.	2 (10%)	1 (5%)	0 (0%)	1 (5%)	16 (80%)
Menu review frequency (annually, bi-annually, etc.) is made clear in policies and procedures.	1 (5%)	0 (0%)	0 (0%)	0 (0%)	19 (95%)
RDN menu review process is clear.	2 (10%)	1 (5%)	0 (0%)	5 (25%)	12 (60%)
Major menu substitutions (such as the main entrée) are decided by the RDN.	3 (15%)	3 (15%)	1 (5%)	5 (25%)	8 (40%)
Foodservices follow menu recommendations made by the RDN.	1 (5%)	4 (20%)	2 (10%)	5 (25%)	8 (40%)

Table 5.5 Survey and Records Request Menu Type Comparison (n=20*)

Survey Response		Records Request	
Gendered or Default		***Gendered or Default***	
Male	16	Male	16
Female	14	Female	15
Seasonal	12	Seasonal	4
Male and Female	10	Male and Female	18
Age-based (eg. less than 21 years old)	8	Age-based (eg. less than 21 years old)	14
Religious		***Religious***	
Kosher	22	Kosher	16
Vegetarian	18	Vegetarian	7
Halal	15	Halal	7
Vegan	13	Vegan	9
Other	8	Other	0
Other	7	***Other***	6

*20 survey responses were recorded by RDNs where multiple menus are served

Table 5.6 Guidelines Used to Determine Nutritional Adequacy (n=20)

	Frequency
Most Common Guidelines (pick 3)	
Dietary Guidelines for Americans (DGAs)	19 (31.7%)
Dietary Reference Intakes (DRIs)	18 (30%)
MyPlate.gov	9 (15%)
American Heart Association Dietary Recommendations	6 (10%)
Dietary Approaches to Stop Hypertension (DASH)	2 (3.3%)
Healthy People 2023 Objectives	1 (1.7%)
Therapeutic Lifestyle Changes (TLC) to Lower Cholesterol	0 (0%)
Other (please specify)	5 (8.3%)

Chapter 6 - Summary and Conclusions

The purpose of this exploratory study was to review United States prison menus nutritionally and investigate factors influencing menus. The findings in this study contribute to the few studies available and build on county jail reviews by Collins and Thompson (2012) and Cook, et al. (2015), and the analysis of Midwestern state prison menus by Holliday and Richardson (2021). Researchers requested master menus and nutrition analyses from each state prison system to assess prison menus. Researchers developed and distributed a survey to corrections professionals to gain insight on menu development influences and practices. This chapter reports major findings, limitations, and recommendations for future research.

Major Findings

The research questions in this study were answered by two simultaneous phases of research data collection methods: document requests and survey invitations. This section will summarize key results for each research question.

Research Question 1

What is the current state of prison menus nutritionally?

Gendered general population master menus served in prisons target males, females, or a combination menu for males and females. Menu type related to overall calories, dietary fiber, sodium, vitamin D, and fruit and vegetable offerings were extracted from menu and nutrition analysis documents collected. Older sedentary females receiving menus served both to males and females receive 1074 calories over recommendations; older sedentary males receive 674 calories

in excess from the same menus. This one-size-fits-all menu does not serve a considerable amount of the incarcerated population.

Average fruit and vegetable servings on prison menus do not meet the Dietary Guidelines for Americans (DGA) minimum recommendations. Only two prisons served more than the 2 cup-equivalent (cup-equ) minimum recommended fruit intake for males and females, and one state did not serve any fruit. The DGAs suggest that no more than half of fruit servings should be consumed by fruit juice; three menus served fruit juice for more than 90% of fruit servings. Twenty-three menus did not meet the recommended three cup-equ vegetables per day. Inadequate fruit and vegetable servings are associated with reduced fiber intake, which is substantiated in this research as male-specific, female-specific, and male and female combined menus all fall short of the fiber guideline. Average sodium on prison menus is 3403 mg per day which exceeds the DGA 2300 mg daily recommendation. Vitamin D included on menu analysis documents was inconsistent but reported to provide 577 IU, less than the recommended 600 IU.

Prison menus on average are nutritionally inadequate. Male and female combined menus provide excessive calories and sodium while simultanelusly not offering enough fruit, vegetable, fiber, or vitamin D on average to both males and females. Long prison sentences increase the likelihood that these inadequacies will be realized as nutrition-related health conditions.

Some prison menus include a fortified beverage to supplement inadequate nutrient offerings, but whether this is ethical is called into question. Many states offering fortified beverages also do not provide adquate fruit offerings suggesting these beverages may be served in place of fruit. Adequate nutrition should primarily be consumed by food and supplements only used in extenuating circumstances; regular inclusion on the menu when food offerings are inadequate does not constitute an extenuating circumstance.

Research Question 2

How does the RDN's role relate to the menu?

Twenty dietitians responded to survey questions regarding the RDN role in menu development. Dietitian job descriptions generally include menu development, but policies and procedures more clearly outline how often RDNs should review menus. Seventeen of 20 dietitians agreed that the menu review process is clear, two somewhat agreed, and one strongly disagreed. When RDNs provide menu recommendations, 13 agreed that foodservices are amenable, two were neutral, and five dietitians disagreed that foodservices follow dietitian recommendations.

Three dietitians disagree that the RDN menu review process is clear. The most common guidelines used when determining nutritional adequacy are Dietary Guidelines for Americans, Dietary Reference Intakes, and MyPlate.gov. Although dietitians use these guidelines, they are inconsistently applied when estimating the reference demographic representative of the prison population as evidenced by the wide range of nutrition offerings provided on prison menus.

Research Question 3

What is the relationship between corrections' organizational factors and nutrition offerings?

Twelve of 20 survey responses indicated that only one dietitian is employed in his or her state prison system. Fifteen corrections nutrition professionals do not work in the same department with foodservice staff indicating an inherent barrier between RDNs and foodservices. Although not contradictory, employers are not overly encouraging of correctional dietitian professional engagement opportunities in professional association affiliate groups targeting corrections RDNs.

At least 15 state prison systems contract for RDN services. Nine of these dietitians approve one menu served to males and females which are shown to be inappropriate especially for incarcerated females. Contract menus serve less fruit and vegetables, and more sodium than average prison menus. Fourteen of the 15 contracted menus include fortified beverages; one contract menu serves 100% fruit offerings as fruit juice, exceeding the DGA recommendation not to consume more than half fruit as juice. Contract prison menus are less adequate than the average prison menu.

Limitations

The methodologies in this research included records requests from Departments of Corrections (DOCs) and survey development and administration. Records departments in 25 states required an application to conduct research with the DOC research unit prior to providing documents. Only 16 applications were approved, four applications denied, and six applications were unreviewed more than 12 weeks after applying. In total, 33 states provided documents but only 19 provided all requested documents. Twenty-nine records departments provided master menus, and 21 provided nutrition analyses. Allowing DOC records departments and research units extended periods of time to respond to requests may yield additional data for future researchers. However, menus are constantly changing and updating; for example, upon first request Virginia noted one menu was available for males and females, but within a month a separate menu for males and females was to be implemented. Waiting long periods of time for records may encounter similar discrepancies.

Survey development denotes that a validated survey instrument is not available. Researchers invited five corrections dietitians to participate in a pilot survey and provide

feedback before making revisions and further distributing the survey. Participants were not offered financial incentives and therefore possibly yielded lower participation. Drawing statistical inferences on a sample as small as 24 may result in a type II error. Survey participants may apply personal bias in responses. These are limitations of implementing a new survey in research.

Implications and Future Research

Results and findings from this research call attention to additional opportunities for future research on corrections nutrition. Recommendations are divided into menu development practices and system organization categories.

Menu Development Practices

Findings from this study suggest that RDNs provide recommendations for menu updates, however dietitians may not have autonomy or responsibility for menu development. The spectrum of menu development may range from foodservice departments consulting annually with dietitians to dietitians developing menus and overseeing implementation. This research provides insight on whether dietitians agree that foodservices follow RDN recommendations, however, the level to which the dietitian is permitted to make menu decisions is yet to be determined.

Current menu trends suggest that overall calorie needs are overestimated. Reasons behind calorie inflation are not documented in literature. Feeding thousands with one or two master menus provides challenges such as taste preferences, food sensitivities that are not allergies, varying activity levels and ages, and kitchen equipment capabilities to meet menu requirements.

Documenting variables necessitating increased calories provides insight on how to manage overfeeding.

Religious menus were collected as part of this research; however, they were not analyzed to the same level as the gendered master menus. Proportion of the incarcerated population receiving specialized religious or alternative menus is unknown. The nutrition content of these menus related to the proportion of people receiving these menus indicates whether these individuals are receiving adequate nutrition. This research indicates the need for generally accepted terminology and development of best practices in corrections, including religious menu offerings.

Two survey responses noted local legislation includes direction on nutrition offerings in prisons. Circuit court decisions on corrections issues may affect more than one state within that jurisdiction and may provide opportunity for public policy to support corrections menu development. Future research determining which legislation affects prison menus and a further analysis on nutritional adequacy in these states provides insight on whether or not public policy positively or negatively influences prison menu nutrition.

Upon intake into a correctional facility, incarcerated individuals receive a medical examination to ensure continuity of care. Prevalence of nutrition-related health conditions like diabetes and hypertension are included during this exam. However, incidence of these nutrition-related health conditions is less documented in research. Inadequate nutrition offered on prison menus may exacerbate these health conditions; only reporting current prevalence does not indicate incidence or compare conditions to adequate nutrition offerings.

Fortified beverage use on prison menus warrants further research. These drinks provide nutrient supplementation missing from menus when menus should provide adequate nutritious

food without supplementation. A thorough review of whether using these drinks in place of nutrient-dense food items is ethical should be conducted.

System Organization

Menu cost is influential to menu decisions but only 13 of 23 corrections nutrition professionals had access to this information. Researching menu cost compared to menu nutritional value increases awareness of the impact that cost has on menu nutrition. All survey participants reported that food cost is a primary driver of menu changes and updates. If menu nutrition suffers due to cost, prisons would do well to measure health indicators affected by inadequate nutrition offerings.

Contracting for foodservice or dietitian services may provide initial cost savings. However, this research indicates that menu nutrition provided by contract menus may be inadequate even if contract requirements suggest otherwise. Future research should analyze proximity of the RDN to foodservice related to RDN influence on menu decisions, especially when contracting these services. Presumably, dietitians working closely with foodservice staff develop relationships and have more access to menu decisions altering nutrition.

Related, it is unclear how adherent foodservices are to menus. Substitutions occur as food costs fluctuate. Dietitians may or may not be notified or included in conversations about substitutions when they are needed. Extenuating circumstances may require hasty decisions, but these should be out of the norm. Positive working relationships developed when dietitians and foodservices collaborate often may help overcome these obstacles. Estimating menu compliance helps RDNs make realistic adjustments to menus to gain insight on actual nutrition vs perceived nutrition.

Adequate training both to the DOC organization as well as nutrition in corrections should be included when dietitians are hired in prisons. Because many dietitians are the only dietitian in the system, it is unclear if dietitians receive any specialized training. Corrections nutrition professionals would benefit by developing industry-wide nutrition training materials to provide RDNs upon entering this specific industry that comes with nuance.

Conclusion

This research suggests the need for corrections-specific recommendations on applying the DGAs to prison populations and menus. Best practices for prison menu development methods will benefit menus and corrections nutrition professionals and in turn the incarcerated individuals receiving prison nutrition offerings. Documenting current trends and patterns on prison menus provides insight for improvement and regulation. Additional research building on this work will support corrections nutrition professionals in determining appropriate guidelines and standards.

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Appendix A - Survey Instrument for Correctional RDNs

Q1: Are you a correctional dietitian (RDN)?

- o Yes
- o No

Display this question:
If Are you a correctional dietitian (RDN)? = No

Q2: What is your job title? (select all that apply)

- ☐ Foodservice director
- ☐ Officer
- ☐ Other (please specify):

  _____

For each of the questions in the following section, please refer to the menus in the prison system where you currently work.

Q3: What types of master menus are available? (select all that apply)

- ☐ Male and Female (same menu served to both genders)
- ☐ Male-specific
- ☐ Female-specific
- ☐ Age-based (eg. for inmates younger than 21 years old)
- ☐ Religion-based: Halal
- ☐ Religion-based: Kosher
- ☐ Religion-based: other
- ☐ _____
- ☐ Vegetarian
- ☐ Vegan
- ☐ Seasonal (rotates based on season, eg. “winter menu” and “summer menu”
- ☐ Other (please describe):

  _____

Q4: What is the length of the master cycle menu?

- o 2 weeks
- o 4 weeks
- o Other (please explain):

  _____

Display this question:
If Are you a correctional dietitian (RDN)? = Yes

Q5: Please select the extent to which you agree with the following statements about the menu in the system you currently work for.

	Strongly Disagree	*Somewhat Disagree*	*Neutral*	*Somewhat Agree*	*Strongly Agree*
The master menu(s) meet the nutritional needs of the inmate population.	o	o	o	o	o
Food cost is the primary driver of menu changes and updates.	o	o	o	o	o
Nutrition is the primary driver of menu changes and updates.	o	o	o	o	o
Local or state regulations specify correctional nutritional requirements.	o	o	o	o	o
Inmates with advanced nutrition requirements receive menus developed specifically for their needs.	o	o	o	o	o

The questions in the following section refer to the ability of prison systems to provide appropriate nutrition to individuals with advanced nutrition needs. Please consider whether the current practices of prison system where you work adequately meet the needs of this population.

Display this question:
If Are you a correctional dietitian (RDN)? = Yes

Q6: What types of medical diets are available? (select all that apply)

- ☐ Diabetic
- ☐ Calorie-controlled (eg. 1500 kcal, 1800 kcal, 3000 kcal, 3500 kcal, etc.)
- ☐ Low sodium
- ☐ Pre-Dialysis / Renal failure
- ☐ Dialysis
- ☐ Allergy
- ☐ Bland
- ☐ Mechanical Soft
- ☐ Other (please describe):

_____

Display this question:
If Are you a correctional dietitian (RDN)? = Yes

Q7: Who is authorized to prescribe a diet order? (select all that apply):

- ☐ Medical Doctor, Physician Assistant, or Dentist
- ☐ RDN
- ☐ Other:
  _____
- ☐ Unsure

Q8: Are inmates with advanced nutrition needs housed in a medical-specific facility operated within the Department of Corrections?

- o Yes
- o No
- o Unsure

Display this question:
If Are inmates with advanced nutritional needs housed in a medical-specific facility operated within the Department of Corrections? = Yes

Q9: Is there an RDN dedicated to working in that medical facility (separate from the RDN planning the master menu)?

- o Yes
- o No
- o Unsure

For each of the statements and questions in the following section, please refer to the role of the RDN or other personnel involved in menu development and production (if an RDN is not currently employed).

Q10: Which department does the RDN report to?

- o Administrative, Clinical, or Medical Bureau
- o Foodservices Department
- o External contract management

Q11: How many RDNs are employed by your prison system (including you)?

- o 1
- o 2
- o 3+

Q12: Who employs foodservice staff?

- o Department of Corrections
- o External contract management company

Q13: What is/are the foodservice director's (or equivalent) qualifications? (select all that apply)

- ☐ Civilian w/culinary experience
- ☐ RDN
- ☐ Officer w/security experience
- ☐ Officer w/culinary or hospitality experience
- ☐ Other (please describe):

  _____

Display this question:
If Are you a correctional dietitian (RDN)? = Yes

Q14: Please select the extent to which you agree with the following statements about your professional involvement.

	Strongly Disagree	*Somewhat Disagree*	*Neutral*	*Somewhat Agree*	*Strongly Agree*
American Correctional Association (ACA) accreditation process includes input from the RDN.	o	o	o	o	o
National Commission on Correctional Health Care (NCCHC) accreditation process includes input from the RDN.	o	o	o	o	o
Membership in affiliate groups for corrections RDNs (such as ACFSA, DHCC DPG, etc.) is encouraged by RDN employer.	o	o	o	o	o

Q15: Please select the extent to which you agree with the following statements about your role in the system you currently work for.

	Strongly Disagree	*Somewhat Disagree*	*Neutral*	*Somewhat Agree*	*Strongly Agree*
RDN is primarily responsible for menu development.	o	o	o	o	o
RDN job description outlines duties related to menu development.	o	o	o	o	o
Menu review frequency (annually, bi-annually, etc.) is made clear in RDN job description.	o	o	o	o	o
Menu review frequency (annually, bi-annually, etc.) is made clear in policies and procedures.	o	o	o	o	o
RDN menu review process is clear.	o	o	o	o	o
Major menu substitutions (such as the main entrée) are decided by the RDN.	o	o	o	o	o
Foodservices follow menu recommendations made by the RDN.	o	o	o	o	o

You are more than halfway done!

The statements and questions in the following section refer to the ability of prison systems to provide appropriate nutrition to the entire prison population. Please consider whether the current practices of prison system where you work adequately meet the variety of needs in this population.

Q16: Was the most recent menu review approved as nutritionally adequate?

- o Yes
- o No
- o Unsure

Display this question:
If Are you a correctional dietitian (RDN)? = Yes

Q17: Nutrition standards for corrections menus are clear.

- o Yes
- o No

Display this question:
If Was the most recent menu review approved as nutritionally adequate? = No

Q18: What recommendations were required to approve the menu? (select all that apply)

- □ Increase fiber
- □ Decrease sodium
- □ Increase fruits
- □ Increase vegetables
- □ Make at least half grains whole grains
- □ Other (please describe):

  _____

Display this question:
If Are you a correctional dietitian (RDN)? = Yes

Q19: Please select the 3 most used guidelines to determine nutritional adequacy:

- □ Dietary Guidelines for Americans (DGAs)
- □ MyPlate.gov
- □ Dietary Reference Intakes (DRIs)
- □ Therapeutic Lifestyle Changes (TLC) to Lower Cholesterol
- □ Dietary Approaches to Stop Hypertension (DASH)
- □ Healthy People 2030 Objectives
- □ American Heart Association Dietary Recommendations
- □ Other (please specify):

  _____

Display this question:
If Are you a correctional dietitian (RDN)? = Yes

Q20: What software is available to calculate the menu nutrition analysis?

- o NutritionistPro™
- o Computrition
- o Other
- o No software is available

The questions in the following section refer to menu costs per portion served. Please report values for the male master menu if multiple master menus are available.

Q21: What is the highest meal cost for:

- Breakfast: _____
- Lunch: _____
- Dinner: _____

Q22: What is the lowest meal cost for:

- Breakfast: _____
- Lunch: _____
- Dinner: _____

The questions in the following section refer to the experience and qualifications of the correctional RDN or menu development personnel. Please consider your current place of employment in your responses.

Q23: What prison system do you work for?

_____

Q24: How many inmates are housed in that prison system?

- 1 - 5,000
- 5,001 - 10,000
- 10,001 - 20,000
- 20,001 - 30,000
- 30,001 - 40,000
- 40,001 - 50,000
- 50,001 - 75,000
- 75,001 or more

Q25: What is your employment status?

- Full-time
- Part-time
- Hourly contract

Q26: How long have you worked in your current prison system?

- Less than 1 year
- 1-2 years
- 2-5 years
- 5 or more years

Q27: How long have you worked in corrections?

- Less than 1 year
- 1-2 years
- 2-5 years
- 5 or more years

Q28: What is your highest level of education?

- Baccalaureate degree
- Some graduate coursework completed
- Master's degree
- Doctoral degree

Appendix B - Informed Consent and Debrief Letters

Dear [first name],

A research team from Kansas State University is conducting a study to gain insight about prison menus. You have been identified as a dietitian with correctional experience as either a member of the Corrections Subunit of the Dietetics in Health Care Communities (DHCC) practice group, the Association of Correctional Foodservice Affiliates (ACFSA), or the National Commission on Correctional Health Care (NCCHC). The purpose of this study is to assess the current nutritional state of prison menus and factors related to menu quality, and we are interested in your experience.

Your responses are very important to the future of corrections nutrition and success of this study. Please consider participating in this survey by spending about 15-20 minutes sharing your experience as a correctional dietitian in your current prison system. Participating in this study is a professional service to dietitians in corrections as further research will build on studies such as this. A summary of survey results will be available to you upon your completion and our compilation of survey responses.

Participation is completely voluntary; no penalty or loss of benefits will result should you choose not to participate or discontinue participation while taking the survey. Your responses are anonymous and confidential. Results are reported in summary format. Information collected from this study will not be used in any future research studies or distributed to others. Completing the survey indicates your approval to participate in this study.

If you have any questions, comments, or concerns about this study, please do not hesitate to contact Laura Bain (bainla@ksu.edu) or Kevin Sauer (ksauer@ksu.edu). If you have any questions about the rights of individuals participating in this study or about the way the study is conducted, you may contact the University Research Compliance Office at (785) 532-3224.

Thank you for your time and assistance,

Laura Bain, RDN, MBA
PhD Candidate
Kansas State University
bainla@ksu.edu

Kevin Sauer, Phd, RDN, LD
Professor
Food, Nutrition, Dietetics, and Health Department
ksauer@ksu.edu

Dear [first name],

Thank you for completing the survey to assess the current state of prison menus. As a reminder, information collected from this study will not be used in any future research studies or distributed to others.
Your participation was integral to the success of the study. If you would like to receive a summary of the results from the study, please contact Laura Bain at bainla@ksu.edu or Kevin Sauer at ksauer@ksu.edu.

Thank you for your time and assistance,

Laura Bain, RDN, MBA
PhD Candidate
Kansas State University
bainla@ksu.edu

Kevin Sauer, Phd, RDN, LD
Professor
Food, Nutrition, Dietetics, and Health Department
ksauer@ksu.edu

Appendix C - Prison Population by State

Table C.1 Prison Population by State

	Total Population	Male Population	Female Population
Federal Bureau of Prisons	158,689	147,916	10,773
Texas	116,684	108,868	7,816
California	96,302	92,583	3,764
Florida	84,797	-	-
Georgia	48,907	45,410	3,497
Ohio	44,169	40,677	3,492
West Virginia	37,790	28,295	9,491
Pennsylvania	37,366	35,529	1,837
Arizona	34,148	31,009	3,139
New York	31,803	30,559	1,244
North Carolina	30,766	28,229	2,537
Illinois	29,666	28,156	1,510
Louisiana	27,677	26,182	1,495
Indiana	23,027	20,868	2,159
Virginia	22,338	21,899	439
Mississippi	21,630	19,738	1,892
Tennessee	21,416	18,991	2,425
Wisconsin	21,104	19,740	1,364
Arkansas	17,814	-	-
Alabama	16,889	15,970	919
South Carolina	15,985	14,859	1,126
Missouri	15,797	13,182	2,615
Colorado	15,508	14,324	1,184
Oklahoma	15,403	13,370	2,033
Maryland	14,948	14,446	502
Oregon	12,282	11,357	925
Washington	12,244	11,580	664
Kentucky	10,663	9,986	677
Nevada	10,431	9,555	876
Connecticut	10,035	9,309	726
New Jersey	9,891	9,535	356
Kansas	8,911	8,159	752
Minnesota	8,152	7,598	554
Iowa	8,110	7,450	660
Idaho	6,745	5,760	985
Utah	6,665	-	-
Massachusetts	6,070	5,845	225

Table C.1 Prison Population by State (cont'd)

	Total Population	Male Population	Female Population
Nebraska	5,676	5,291	385
New Mexico	5,651	5,128	523
Alaska	4,738	4,279	459
Michigan	4,551	4,140	411
Delaware	3,471	-	-
South Dakota	3,423	2,891	532
Hawaii	3,099	2,684	415
Montana	2,752	2,508	244
Wyoming	2,196	1,949	247
Rhode Island	2,132	2,031	101
New Hampshire	2,000	1,863	137
Maine	1,756	1,585	171
North Dakota	1,401	1,239	162
Vermont	1,205	1,110	95
State totals:	**996,184**	**815,716**	**67,762**

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Appendix D - The Dietary Guidelines for Americans

Recommendations

Table D.2 Weekly Vegetable Recommendations for Adults Ages 19-59 and 60 and Older

Age 19-59	Recommendation[a] (cup-equ)	Age 60 and Older	Recommendation[a] (cup-equ)
Vegetable Subgroup		***Vegetable Subgroup***	
Dark-Green	1.5	Dark-Green	2
Red and Orange	5.5	Red and Orange	6
Beans, Peas, Lentils	1.5	Beans, Peas, Lentils	2
Starchy	5	Starchy	6
Other	4	Other	5

[a]USDA, 2020a, pp. 96 and 125

Table D.3 Calorie Recommendation Based on Gender, Activity Level, and Age

	MALE			FEMALE		
Age	**Sedentary**	**Moderately Active**	**Active**	**Sedentary**	**Moderately Active**	**Active**
18	2400	2800	3200	1800	2000	2400
19-20	2400	2800	3000	2000	2200	2400
21-25	2400	2800	3000	2000	2200	2400
26-30	2400	2600	3000	1800	2000	2400
31-35	2400	2600	3000	1800	2000	2200
36-40	2400	2600	2800	1800	2000	2200
41-45	2200	2600	2800	1800	2000	2200
46-50	2200	2400	2800	1800	2000	2200
51-55	2200	2400	2800	1600	1800	2200
56-60	2200	2400	2600	1600	1800	2200
61-65	2000	2400	2600	1600	1800	2000
66-70	2000	2200	2600	1600	1800	2000
71-75	2000	2200	2600	1600	1800	2000
76 and up	2000	2200	2400	1600	1800	2000

[a]USDA, 2020a, Appendix 2

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Appendix E - Fortified Beverage Nutrition Specifications Examples

Figure E.1 National Food Group Fortified Beverage Specification Sheet

Always Available.

National food group

PC Drink Mix + Vits C&D, Punch

Product Details:

Item Number: 90340CD
Pack Size: 2000/1g pkts
Serving Per Case: 2,000
Net Weight: 4.85 lbs.

Sales Price Per EACH: N/A
Case Price: N/A

Kosher: Yes
Meal Contribution:
Class: Always Available
Shelf Life:
Temperature Class: Dry
Cook State: NA
GTIN-12 UPC:
GTIN-14:

Ingredients:

Citric Acid, Maltodextrin, Aspartame*, Ascorbic Acid, Corn Syrup Solids, Acesulfame Potassium, Artificial Flavor (dextrose, silicon dioxide), Red 40, Tricalcium Phosphate, Vitamin D2. *Phenylketonurics: Contains Phenylalanine.

Benefits and Suggested Use:

Fruit flavored beverage packets fortified with Vitamin C, Vitamin D, Calcium, Phosphorus, Potassium. Presweetened. Add water only. Kosher, Low Sodium, Gluten Free and Vegan. 1 year shelf life. Flavors: Grape, Lemon, Orange, Punch

Nutrition Facts

This is a representation of the nutritional label. The nutritional label on the product may vary.

Serving Size	8 oz.
Amount Per Serving	
Calories	**2.51**
	% Daily Value *
Total Fat 0g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium .09mg	**0%**
Total Carbohydrate 1g	**0%**
Dietary Fiber 0g	**0%**
Total Sugars .03g	
Incl. Added Sugars	–
Protein .06g	0%
Vitamin D 399.76IU	100%
Calcium 1.93mg	0%
Iron 0	0%
Potassium 4.79mg	0%

* The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

National Food Group
Email: info@nationalfoodgroup.com . **Direct:** 800.886.6866
Fax: 248.669.3000
46820 Magellan Dr., Suite A, Novi, MI 48377-2454
www.nationalfoodgroup.com . **Call Toll Free:** 800.886.6866

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Figure E.1 National Food Group Fortified Beverage Specification Sheet (cont'd)

Figure E.2 GoodSource® Solutions Foodservice Distribution Fortified Beverage Specification Sheet

Figure E.3 GoodSource® Solutions Foodservice Distribution Fortified Beverage Specification Sheet (cont'd)

ENJOY OUR BEVERAGES ANY TIME!

Seasonal Varieties · Custom Blends & Packaging · Volume Pricing

Good Source Drink Mix

P/C (Portion Controlled Size)

Pack: 2000/1g · Pallet: 100 cases
Yield: (1) 8 oz. serving

07201P	Fruit Punch Drink Mix
07202P	Orange Drink Mix
07203P	Grape Drink Mix
07204P	Lemon/Lime Drink Mix
07206P	Iced Tea Drink Mix
07209P	Tropical Splash Drink Mix
07221P	Cherry Vanilla Drink Mix

Bulk

Pack: 144/53.5g · Pallet: 90 cases
Yield: 720 gallons

07211B	Fruit Punch Drink Mix
07212B	Orange Drink Mix
07213B	Grape Drink Mix
07214B	Lemon/Lime Drink Mix
07216B	Iced Tea Drink Mix
07219B	Tropical Splash Drink Mix
072218	Cherry Vanilla Drink Mix

Colorless Drink Mix

P/C

Pack: 2000/1g · Pallet: 100 cases
Yield: (1) 8 oz. serving

07201CP	Fruit Punch Colorless Drink Mix
07202CP	Orange Colorless Drink Mix
07203CP	Grape Punch Colorless Drink Mix

Bulk

Pack: 144/53.5g · Pallet: 90 cases
Yield: 5 gallons/packet; 720 gallons/case

07221CB	Fruit Punch Colorless Drink Mix
07222CB	Orange Colorless Drink Mix
07223CB	Grape Colorless Drink Mix
07224CB	Lemon/Lime Colorless Drink Mix

Good Source Nutri-Cal®

P/C (Portion Controlled Size)

Pack: 1000/2.64g · Pallet: 100 cases
Yield: (1) 8 oz. serving

03801P	Berry Punch Nutri-Cal®
03802P	Orange Nutri-Cal®
03803P	Grape Nutri-Cal®
03804P	Raspberry Lemonade Nutri-Cal®

Bulk

Pack: 72/7.45 oz. · Pallet: 40 cases
Yield: 360 gallons

03811B	Berry Punch Nutri-Cal®
03812B	Orange Nutri-Cal®
03813B	Grape Nutri-Cal®
03814B	Raspberry Lemonade Nutri-Cal®

SmartMilk®

P/C 32223
Pack: 300/0.88 oz. · Pallet: 50 cases
Yield: (1) 8 oz. serving

IDEAL FOR:

· Correctional Industry Meals
- Breakfast
- Lunch
- Dinner

· Emergency Feeding
· Senior Feeding
· After School Programs
· Disaster Relief
· Sack Lunches
· Summer Camps

GoodSource SOLUTIONS Foodservice Distribution

3115 Melrose Drive, Suite 160 · Carlsbad, CA 92010 · 800.776.6758 · goodsource.com

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