

AN ASSESSMENT OF REGISTERED DIETITIAN NUTRITIONISTS' ATTITUDES AND  
BEHAVIORS IN CULINARY MEDICINE AND THE ROLE OF THE RDN

By

Ellen McEwen, B.A.

A Project Submitted in Partial Fulfillment of the Requirements

for the Degree of

MASTER of SCIENCE

in

Dietetics and Nutrition

University of Alaska Anchorage

May 2023

APPROVED:

Carrie King, Ph.D., Committee Chair

Amanda Walch, Ph.D., Committee Member

Heather Nace, B.S., Committee Member

LeeAnne Carrothers, Ph.D., Assistant Dean

*School of Allied Health*

Kendra Sticka, Ph.D., Associate Dean of Clinical Health Sciences

*College of Health*



## Abstract

Culinary medicine (CM) is an emerging practice that combines evidence-based guidelines for health and disease management with practical food preparation techniques.<sup>1,2</sup> Americans spend little time in the kitchen. Meanwhile, chronic diseases such as diabetes, hypertension, and heart disease are increasingly common in the American population. CM can teach practical, buildable skills to help alleviate these conditions. Registered Dietitian Nutritionists (RDNs) are food and nutrition experts who are well-positioned to be leaders in CM interventions but current research suggests an overall lack of understanding in how RDNs engage in CM in their work. Most RDNs work in the clinical setting, which suggests that culinary skills interventions are not necessarily a priority or a feasible option in their jobs. The objective of this project was to understand the RDNs' attitudes and behaviors in CM and their role in CM. An electronic survey was sent to 4,865 RDNs utilizing the Academy of Nutrition and Dietetics Student Research Request Application process. A total of 175 RDNs completed the survey. The results showed that overall RDNs have good exposure to culinary activities in the didactic setting but once they reach supervised practice, they receive almost no cooking education. This lack of exposure in supervised practice may explain why RDNs do not use CM to its full potential, because they have not been taught a practical application of it in the work setting. RDNs reported confidence in cooking but seem unsure if they have the education and training needed to provide CM to patients. This project provided more insight into RDN work activities and revealed the importance of continuing culinary education for RDNs.

## Table of Contents

Title Page.....	i
Abstract.....	iii
Table of Contents.....	iv
List of Appendices.....	vi
Acknowledgments.....	vii
Introduction.....	1
Literature Review.....	3
Research Question.....	8
Research Goal and Objective.....	8
Methods.....	8
Analysis.....	10
Results.....	11
Discussion.....	20
Strengths and Limitations.....	24
Conclusions.....	25
Dietetics and Nutrition Practice Implications.....	26
References.....	27
Appendices.....	31

## **List of Tables**

Table 1: Demographic Data .....	11
Table 2: Culinary Medicine Education .....	14
Table 3: Culinary Medicine Work Experience .....	15
Table 4: Registered Dietitian Nutritionists' Attitudes About Culinary Medicine.....	16
Table 5: Registered Dietitian Nutritionist Behaviors in Culinary Medicine at Work .....	18
Table 6: Conditions in Which Registered Dietitian Nutritionists Use Culinary Medicine.....	19

## **List of Appendices**

Appendix A - Survey of Registered Dietitian Nutritionists' (RDNs) Attitudes and Behaviors in Culinary Medicine and the Role of the RDN.....	31
Appendix B - Original and Modified Survey Questions .....	38
Appendix C - Survey Cover Letter .....	41
Appendix D - Informed Consent.....	43
Appendix E - University of Alaska Anchorage Dietetics and Nutrition Faculty Content Validity Email .....	45
Appendix F - Content Validity and Pilot Study Evaluation Questions .....	46
Appendix G - University of Alaska Institutional Review Board Approval Letter .....	47
Appendix H - Fairbanks Memorial Hospital Dietetics Staff Face Validity Email .....	48
Appendix I - Student Research Request Application Form.....	49
Appendix J - First Recruitment Message.....	55
Appendix K - Follow Up Recruitment Email.....	56

## **Acknowledgments**

I am deeply grateful to the many people who willingly gave their time and expertise to helping me through this project. I am proud of the work we accomplished.

To Dr. Carrie King, thank you for your thoughtful guidance and unwavering encouragement through every step of this project. Working with you has genuinely been the highlight of my time at UAA. To Dr. Amanda Walch, you were always the fresh eyes this project needed. Your insights made this project stronger and more well-rounded. To Chef Heather Nace, thank you for sharing your unique chef RD perspective and firsthand experience in the world of culinary medicine. To Dr. LeeAnn Carrothers and Dr. Kendra Sticka, thank you for your support in this process.

Special thank you to Dr. Leslie Redmond, Amy Urbanus, and Melissa Chlupach for their thoughtful discussion, insights, and suggestions for all the different directions culinary medicine can go. To the dietitians at Fairbanks Memorial Hospital for their contributions to the survey development. To Ahnie Litecky for her highly detailed editing services.

To my husband Dan for his constant love and support throughout this project and beyond. Finally, to my mom, Mary Musil, MS, RDN, LD. This project is for you.

## **Introduction**

Culinary medicine (CM) is an emerging practice that combines evidence-based guidelines for health and disease management with practical food preparation techniques.<sup>1,2</sup> With the help of CM, patients are taught how to prepare nourishing foods specific to their health condition. CM can take traditional nutrition education a step further by empowering patients with buildable skills to prepare foods in unique, healthful, and delicious ways. Furthermore, it allows patients the flexibility to honor and enjoy foods they prefer.<sup>1,2</sup>

Registered dietitian nutritionists (RDNs) are food and nutrition experts. They complete a bachelor's degree (at minimum), an accredited supervised practice program, and pass a national certifying exam.<sup>3</sup> RDN coursework and training cover a variety of food topics, including culinary arts, food safety, and food science. RDNs are educated in medical nutrition therapy to understand the evidence-based, clinical nutrition needs for disease management.<sup>4</sup> They are well versed in behavior change theories and regularly use evidence-based counseling and education techniques to promote positive behavior change. Finally, they understand the complex blend of emotional, cultural, and environmental factors that influence food choices and health behaviors.<sup>4</sup> With this unique blend of talents, RDNs are well-poised to be the go-to CM practitioners and educators.

Nevertheless, RDNs are not currently at the forefront of CM training, education, or program development. Most CM training takes place in medical schools and medical residencies in an effort to bolster medical providers' nutrition knowledge in the wake of growing diet-related chronic diseases in the general population.<sup>4,5</sup> Barkoukis et. al.<sup>5</sup> found that only 36% of CM programs included an RDN as a culinary expert. However, culinary interventions have been shown to improve dietary intake and overall attitude and self-efficacy for cooking behaviors,



particularly when combined with nutrition education.<sup>6</sup> RDNs can offer both culinary interventions and nutrition education and, therefore, should be included in CM practices and education programs.

To further understand how RDNs can be at the forefront of CM intervention strategies, it is important to understand how they view their role in CM. Since its inception, the profession has seen a shift from defining an RDN as someone who cooks nutritious meals for patients to a more modernized definition of a scientifically trained practitioner in nutrition care for patients needing therapeutic dietary guidance.<sup>7</sup> The profession has advanced from a home economics position to an allied health position, arguably losing the element of food preparation in favor of a more clinical approach.<sup>7,8</sup> This project investigated the level of food and culinary training that RDNs received throughout their education and how they used that training in their careers. It also assessed the attitudes and behaviors of RDNs and the role of the RDN in CM.

## Literature Review

Studies suggest Americans eat meals outside of the home more than ever before, despite a growing interest in home-cooked meals attributed to popular cooking television shows and social media.<sup>9</sup> Data from the Bureau of Labor Statistics supports this claim. In 2018, Americans spent an estimated 44% of food spending on eating out.<sup>10</sup> Americans reportedly only want to spend about an hour per day in the kitchen.<sup>11</sup> Studies indicate that the disconnect between interest in cooking and actual cooking can be explained primarily by the perceived high cost of food, available time to prepare it, and lack of confidence in individual cooking skills.<sup>9,10</sup>

This decrease in cooking activities is evident in the RDN population. The Commission on Dietetic Registration (CDR) is the credentialing agency for the Academy of Nutrition and Dietetics (the Academy). The CDR conducts surveys of entry-level RDNs every five years to understand the activities of working RDNs. The results of these surveys help inform the credentialing exam. Results from the 2020 survey indicated that of the 2,847 entry-level RDNs surveyed, only 19% were involved in conducting culinary demonstrations or education in some way.<sup>13</sup> This figure is down from the 2015 survey, which found that 27% were involved in conducting culinary demonstrations and education.<sup>14</sup> A reported 15% of RDNs provided culinary expertise to individuals or groups in the 2020 survey.<sup>13</sup> In neither 2015 nor 2020 did these activities meet the 40% threshold for being considered “core activities,” or those that RDNs are frequently involved in at least 5 days per month.<sup>14</sup> The 2020 survey stated that “providing culinary expertise to individuals and/or groups” is a newer activity the survey measures, and though it is not a widely prevalent practice now, the survey suggested monitoring it more closely in the future.<sup>13</sup> The 2005 and 2010 surveys did not ask about culinary activities at all.<sup>15,16</sup> Given this fact, and the suggestion in the 2020 survey to monitor culinary activities more closely, it

appears that awareness and use of culinary interventions are gaining momentum among RDNs.

Cooper et. al.<sup>17</sup> explored the knowledge and confidence of Canadian undergraduate dietetic students' cooking knowledge and skills. Their results showed that students of any grade level only had a moderate knowledge of basic culinary skills and concepts, despite older students having more education in cooking and nutrition. The researchers cite "societal patterns of the early 21st century," including increased access to easy-to-prepare foods, to help explain the apparent lack of advanced cooking knowledge.<sup>17p.44</sup> Other studies have cited a lack of home economics classes in schools and an arguable loss of generational teaching of cooking skills to also explain why Americans are overall less interested in cooking.<sup>11</sup> There is debate in the dietetic profession whether the shift from a home economic approach to a clinical approach has come at the cost of RDNs losing their connection with food preparation.<sup>8</sup> The profession wanted to avoid the traditional home economics approach in the wake of the 1960s and 1970s feminist movement.<sup>8</sup> An Australian study that explored if cooking should be a dietetic competency makes a similar argument. The authors question if the shift away from cooking and the home economics approach has inadvertently supported cultural shifts to convenience food markets or to food consumption requiring little preparation or skill.<sup>18</sup> Fortunately, CM is an opportunity to merge the kitchen and the clinic while maintaining forward momentum in the dietetics profession.

Culinary medicine has emerged in the past 20 years, primarily in medical schools, as a way to combat increasing rates of obesity, type 2 diabetes, heart disease, and cancer.<sup>1,9,12,19,20</sup> Dissatisfaction in the medical community with the modern medical approach to chronic illnesses and rising healthcare costs have also fueled CM forward.<sup>1</sup> Integrating an effective nutrition curriculum into medical schools remains a challenge, and RDNs have reported a lack of confidence that medical students are graduating with sufficient knowledge.<sup>25</sup> A 2021 study found

that before a CM training program, only 37% of medical students understood the role of the RDN.<sup>24</sup> After the program, it increased to 97%. Integrating more nutrition education for medical students can serve dual benefits. First, doctors can improve their understanding of the relationships between diet and disease, which can directly improve patient care. Second, they can also gain a stronger understanding of why RDNs are the more qualified practitioner on the healthcare team to offer patients comprehensive advice on the relationship between diet and disease.<sup>26</sup> The Academy takes the position that with RDNs at the forefront of nutrition education in medical schools, doctors will be more likely to consult RDNs and refer patients to their services.<sup>26</sup>

Other CM programs have been successfully implemented in community and outpatient settings. Organizations like Cooking Matters offer free curriculums to support cooking education for parents and caregivers of young children.<sup>21</sup> Programs such as the Diabetes Prevention Program have demonstrated that lifestyle intervention reduces the likelihood of developing type 2 diabetes significantly more than pharmacological interventions alone.<sup>2</sup> Culinary medicine interventions are also making their way into clinical settings with various active pilot programs. One program, Diabetes-Inspired Culinary Education, uses CM to help improve diets for youths with type 1 diabetes.<sup>22</sup> A primary care clinic in Boston, Massachusetts has successfully piloted shared medical appointments. Patients with common concerns seen in primary care such as metabolic syndrome, type 2 diabetes, and cardiovascular disease are seen by a medical doctor and participate in culinary skills workshops led by a culinary-trained physician and/or chef.<sup>23</sup> Both programs demonstrate that CM interventions can be easily tailored for different populations and can improve eating behaviors.<sup>22,23</sup>

The most well-understood outcomes of CM interventions include increased self-efficacy

about cooking behaviors and increased fruit and vegetable consumption.<sup>6</sup> While more research is needed on CM's effect on biometric outcomes, research currently suggests that food and cooking interventions are linked to a decrease in body mass index and hemoglobin A1c in patients with diabetes. Participating in CM programs has also led to a decrease in inpatient admissions for patients with medically complex conditions such as cancer or chronic heart failure.<sup>19,20</sup> Mauriello et. al.<sup>27</sup> suggest that a successful CM program includes an RDN, a culinary-trained physician or clinician, a curriculum, a teaching space, organizational support, and partners. RDNs can fill many of these required roles, including designing a curriculum (licensed curriculums are an option as well) and doing logistical planning.

Understanding how RDNs can facilitate CM interventions is made more meaningful by understanding their own perceptions about cooking and food preparation. A 2001 survey of RDNs' perceived culinary skills found that while nearly all of the respondents indicated they receive requests about recipe modifications and food preparation, less than 10% of them regularly provided it.<sup>28</sup> Seventy-five percent of RDNs agreed that taste affects compliance with therapeutic diets, yet over half felt they only had average knowledge of food principles and food preparation. Almost 40% responded that they could not explain culinary techniques.<sup>28</sup>

A 2021 study explored the difference in opinions and perspectives on nutrition and food preparation between patients and RDNs.<sup>29</sup> Patients reported that RDNs did not have enough knowledge of their cultural foods and did not know if their cultural foods could be included in a healthy diet plan. Patients also believed that "diet" foods did not taste good and did not think they had adequate cooking or meal-planning skills to implement the dietary changes suggested by the RDN. They reported that it took too much time to cook and too much effort, so they often fell back on easier-to-prepare, less healthy foods and fast food or restaurant meals. Overall, there

was a misconception that healthy, vegetable-rich cooking was too expensive and time-consuming.<sup>29</sup>

RDNs echoed some of the patient comments and felt that they had basic cooking knowledge, but no advanced knowledge of different flavor profiles or cooking methods for different cultural dishes.<sup>29</sup> RDNs reported an interest in talking about more specific cooking ideas with patients rather than just going over a handout, but facilities to demonstrate cooking were limited. They also reported that how the doctor framed their services (positively or negatively) directly affected how the patient interacted with them. The findings from this study suggest that a team approach, as practiced in CM, can be hugely beneficial for simplifying and unifying the message to patients about health and nutrition recommendations. CM can also teach patients several levels of cooking strategies to improve their knowledge of healthy, quick meals that honor their cultural preferences.

These two studies exploring RDNs' cooking competence and how it influences patient care are separated by 20 years.<sup>28,29</sup> Given the scarcity of research on how RDNs engage in culinary activities and the growing body of evidence demonstrating its efficacy in patient care, it is vital to gather more feedback from RDNs. This study aims to fill that research gap.

## **Research Question**

What are RDNs' attitudes and behaviors in culinary medicine and what is the role of the RDN?

## **Research Goal and Objective**

Goal: Evaluate RDNs' attitudes and behaviors in culinary medicine and their role.

Objective: Conduct a survey using a random sample of RDNs to understand their attitudes and behaviors in culinary medicine and their role.

## **Methods**

This study utilized a cross-sectional study design. The survey (Appendix A) was 40 questions total. Participants were asked to assess their attitudes and behaviors about CM, cooking, and patient care. There were two screening questions at the beginning of the survey to determine eligibility. The survey questions were selected by reviewing studies of similar topics and modifying the key wording of their surveys to reflect the research topic.<sup>24,28,31-33</sup> A chart showing the original questions and how they were modified for the survey is included in Appendix B. The survey questions were primarily Likert scale questions. Also included were multiple-choice, fill-ins, and one matrix question. The survey was entered into Qualtrics, an online survey software licensed by UAA. The survey also included a cover letter (Appendix C) and an informed consent document (Appendix D) before taking the survey.

The survey was sent to the University of Alaska Anchorage (UAA) Dietetics and Nutrition faculty to establish initial content validity (Appendix E). The UAA faculty are content experts in the field of nutrition and dietetics and confirmed that the survey was relevant to the research question and that the survey questions were worded clearly and appropriately.<sup>34</sup> The

UAA faculty were asked to complete a short questionnaire about the survey (Appendix F). The survey was also reviewed by Heather Nace, a committee member for this research project and a content expert in CM. She is an RDN and the Director of Operations and Executive Chef at the Goldring Center for Culinary Medicine at Tulane University School of Medicine in New Orleans, Louisiana.

This study was reviewed by the UAA Institutional Review Board (IRB) and found to qualify for Exemption 2.ii. The UAA IRB approval letter is included in Appendix G. After UAA IRB approval, the study was pilot tested for face validity. It was sent to the team of RDNs currently working at Fairbanks Memorial Hospital in Fairbanks, Alaska. Communications to them are included in Appendix H. These RDNs were chosen for face validity review because they met the requirements for participation in the survey. Pilot study participants were asked to fill out the same questionnaire as the content validity reviewers (Appendix F) to assess the quality of the survey. An IRB modification was completed to make minor edits to the survey following the pilot study.

After receiving UAA IRB approval, an application was submitted to the Academy of Nutrition and Dietetics (the Academy) for use of their General Registry List. Nutrition and dietetic students can apply to use the Academy's list in academic research projects as a participant recruitment tool.<sup>30</sup> The application (Appendix I) included the survey tool and an explanation of how the survey fit the Academy's objectives, goals, and vision. The survey was reviewed by the Survey Review Subcommittee under the Academy's Council on Research. The Subcommittee provided feedback and approval and a second IRB modification was completed before it was sent out to RDNs.



The survey was sent to RDNs by the Academy marketing team. Based on the inclusion criteria, the Academy can randomly generate up to 5,000 email addresses from their General Registry of approximately 110,000 credentialed practitioners.<sup>30</sup> The inclusion criteria for this study were RDNs ages 18 and older in the United States with an active Commission on Dietetic Registration (CDR) registration. The exclusion criteria were anyone who was not an RDN, who was under the age of 18, who lived outside the United States, and/or who had an inactive CDR registration. The marketing team sent the initial email and then a reminder email one week afterward (Appendices J and K). The survey was available to participants for two weeks.

After completing the survey, participants were asked if they wanted to participate in an optional, random drawing for one of four \$25 Amazon.com e-gift cards (Appendix A). If participants responded yes, then they were sent to a new, separate survey where they voluntarily filled in their name and email address to be entered into the random drawing. To select the winners after the survey closed, each name was assigned a number. The online random number generator [www.random.org](http://www.random.org) was used to select four of the numbers. The winners received their e-gift cards within one week of the survey close date.

### **Analysis**

Statistical Package for the Social Sciences (SPSS) was used for data management and analysis.<sup>35</sup> A codebook was developed and used to define and label the variables in the survey. The demographic and survey data are reported descriptively. Means and standard deviations were calculated for continuous variables such as the attitude questions (Table 4) and respondents' age. Likert scale responses are reported as frequencies and percentages as well as most of the demographic questions.

## Results

The Academy marketing team sent 4,865 emails. A total of 210 participants opened the survey. Thirty-five participants did not proceed past the initial screening questions and those responses were deleted. A total of 175 participants completed the survey. The majority of the participants, as described in Table 1 below, were women (95.4%, n = 167), of non-Hispanic, non-Latinx, and non-Spanish origin (86.9%, n = 152), and white (85.7%, n = 150). Over half (56.6%, n = 99) had completed a graduate degree (Master's and/or PhD). Nearly 75% (n = 130) reported working full time and the most reported income was (29.7%, n = 52) \$60,001-\$80,000 per year. Most respondents graduated from their accredited program before 2001 (34.3%, n = 60) followed by before 2008 (14.9%, n = 26). The most commonly reported primary work setting was "other" (22.9%, n = 40) followed by acute care inpatient (21.1%, n = 37), and ambulatory/outpatient care facility (18.3%, n = 32). The highest reported Practice Group affiliations included Diabetes, Weight Management, and Cardiovascular Health and Well-being.

**Table 1: Demographic Data**

	<i>(Mean +/- S.D.)</i>
Age	42.0 +/- 12.8
	<i>n (%)</i>
Gender	
Male	3 (1.7%)
Female	167 (95.4%)
Non-binary	0 (0%)
Other	0 (0%)
Prefer not to answer	3 (1.7%)
Hispanic, Latinx, or Spanish origin	
Hispanic	7 (4.0%)
Latinx	1 (0.6%)
Spanish	1 (0.6%)
Non-Hispanic, Non-Latinx, non-Spanish origin	152 (86.9%)
Prefer not to answer	10 (5.7%)

**Table 1: Demographic Data, continued**

<b>Race</b>	
Native American Indian or Alaska Native	1 (0.6%)
Asian	9 (5.1%)
Black or African American	3 (1.7%)
Native Hawaiian or other Pacific Islander	0 (0.0%)
White	150 (85.7%)
Unknown	3 (1.7%)
Other/Prefer to self-describe	4 (2.3%)
Prefer not to answer	6 (3.4%)
<b>Highest degree program completed</b>	
Bachelor's Degree	72 (41.1%)
Graduate Degree (Master's PhD)	99 (56.6%)
Professional Degree (MD/DO, JD, etc.)	2 (1.1%)
<b>Average hours worked</b>	
Full time	130 (74.3%)
Part time	26 (14.9%)
Leave of absence	4 (2.3%)
Retired	6 (3.4%)
Other	7 (4.0%)
<b>Income level</b>	
Under \$20,000	7 (4.0%)
\$20,001 - \$40,000	9 (5.1%)
\$40,001 - \$60,000	38 (21.7%)
\$60,001 - \$80,000	52 (29.7%)
\$80,001 - \$100,000	34 (19.4%)
\$100,001 or over	15 (8.6%)
Prefer not to answer	18 (10.3%)
<b>CADE/ACEND completion year</b>	
Pre-2001	60 (34.3%)
2002-2008 (2002 academic standards)	8 (4.6%)
2009-2012 (2008 academic standards)	26 (14.9%)
2013-2017 (2012 academic standards)	48 (27.4%)
2018-2022 (2017 academic standards)	23 (13.1%)
Other	10 (5.7%)
<b>Primary work setting</b>	
Acute care inpatient	37 (21.1%)
Acute e-care inpatient	0 (0.0%)
Acute care outpatient	6 (3.4%)
Acute e-care outpatient	1 (0.6%)

**Table 1: Demographic Data, continued**

Ambulatory/outpatient care facility	32 (18.3%)
Long term care	13 (7.4%)
Assisted living or group home	0 (0.0%)
School nutrition	5 (2.9%)
Social services organization	4 (2.3%)
College & university dining	1 (0.6%)
College, university, or academic medical center	15 (8.6%)
Private practice	15 (8.6%)
Office	4 (2.3%)
Other	40 (22.9%)
Member of Dietetic Practice Groups?	
Yes	60 (34.3%)
No	114 (65.1%)

Participants were asked which culinary activities they received training in during their Accreditation Council for Education in Nutrition and Dietetics (ACEND) or Commission for Accreditation for Dietetics Education (CADE) accredited classroom, lab, and supervised practice education. As Table 2 below shows, the most commonly reported activities in the classroom were food science (65.1%, n = 114), menu development (54.9%, n = 96), and meal planning (52.6%, n = 92). The least reported activities in the classroom were knife skills (8.6%, n = 15), batch cooking (14.9%, n = 26), and pantry shopping (17.7%, n = 31).

The most commonly reported activities in the lab setting were food science (50.9%, n = 89) and basic culinary skills (48.6%, n = 85). The least reported activities were meal planning (8.0%, n = 14) and pantry shopping (8.6%, n = 15). In the supervised practice setting, menu development was the most commonly reported activity (31.4%, n = 55), followed by recipe modification (28.0%, n = 49), and meal planning (26.9%, n = 47). The least reported activities were food science (16.0%, n = 10), knife skills (9.7%, n = 17), and pantry shopping (14.3%, n = 25). Basic culinary skills (25.7%, n = 45), recipe modification (19.4%, n = 34), and food science (16.0%, n = 28) were the most commonly reported activities taught in all three settings

(classroom, lab, and supervised practice). RDNs also report receiving culinary skills training through culinary schools.

Approximately 42% (n = 73) of RDNs did not receive education in pantry shopping in any setting. Whereas 36% (n = 63) of respondents reported receiving no education in knife skills and 32% (n = 56) reported no education in batch cooking. Nearly 15% (n = 26) reported receiving no education in basic culinary skills in any setting.

**Table 2: Culinary Medicine Education**

	<i>n (%)</i>				
	Classroom	Lab	Supervised Practice	All	None
Basic culinary skills	62 (35.4%)	85 (48.6%)	35 (20%)	45 (25.7%)	26 (14.9%)
Menu development	96 (54.9%)	19 (10.9%)	55 (31.4%)	22 (12.6%)	15 (8.6%)
Meal planning	92 (52.6%)	14 (8.0%)	47 (26.9%)	18 (10.4%)	27 (15.4%)
Recipe development	42 (24.0%)	36 (20.6%)	36 (20.6%)	25 (14.3%)	48 (27.4%)
Recipe modification	69 (39.4%)	45 (25.7%)	49 (28.0%)	34 (19.4%)	21 (12.0%)
Pantry shopping	31 (17.7%)	15 (8.6%)	25 (14.3%)	10 (5.7%)	73 (41.7%)
Knife skills	15 (8.6%)	46 (26.3%)	17 (9.7%)	12 (6.9%)	63 (36.0%)
Batch cooking	26 (14.9%)	29 (16.6%)	33 (18.9%)	24 (13.7%)	56 (32.0%)
Food Science	114 (65.1%)	89 (50.9%)	10 (5.7%)	28 (16.0%)	8 (4.6%)

Table 3 below describes CM work experience. When asked about the culinary activities RDNs use at work, the most commonly reported activities were cooking demonstrations (55.4%, n = 97), leading discussions on the therapeutic value of food (44.0%, n = 77), and curriculum

development (26.3%, n = 46). Nearly 30 respondents (n = 16.6%) reported attending cooking classes as part of their continuing education. The culinary medicine facilities most used by RDNs were teaching kitchens (26.9%, n = 47), the RDN's home kitchen (22.9%, n = 40), and conference rooms (14.3%, n = 25). RDNs wrote in other culinary experience, including Continuing Education Units (CEUs) in culinary topics, previous paid kitchen work such as restaurant jobs, and advanced academic training such as degrees in food science or culinary arts.

**Table 3: Culinary Medicine Work Experience**

	<i>n (%)</i>
Type of culinary medicine activities at work	
Case study evaluation	32 (18.3%)
Interdisciplinary delivery of cooking classes	40 (22.9%)
Cooking demonstrations	97 (55.4%)
Lead discussion on the therapeutic value of food	77 (44.0%)
Curriculum development	46 (26.3%)
Curriculum delivery to dietetic students	33 (18.9%)
Curriculum delivery to medical students	14 (8.0%)
Other	8 (4.6%)
Have you pursued continuing education in culinary medicine	
Culinary medicine program	6 (3.4%)
Culinary travel	12 (6.9%)
Cooking classes	29 (16.6%)
CEU courses	23 (13.1%)
Other	7 (4.0%)
Culinary medicine facilities used	
Teaching kitchens	47 (26.9%)
Conference room	25 (14.3%)
Commercial kitchen	16 (9.1%)
Cooking cart	9 (5.1%)
RDN's home kitchen	40 (22.9%)
Client/patient's home kitchen	10 (5.7%)
Food distribution program	15 (8.6%)
Community food program	15 (8.6%)
School kitchens	10 (5.7%)
WIC	9 (5.1%)
SNAP	7 (4.0%)
EFNEP	4 (2.3%)
Other	6 (3.4%)

The attitude questions, as described in Table 4 below, asked respondents to rate their level of agreement on a scale of 1-11, with 1 being n/a. Two was the lowest agreement, and 11 was the highest agreement with the statement. There was strong agreement that it is possible to offer recipes that taste good and are nutritious ( $M = 10.68$ ,  $SD = 0.79$ ) and that taste affects compliance with a specific diet ( $M = 10.34$ ,  $SD = 1.38$ ). RDNs also reported that they enjoyed cooking ( $M = 9.47$ ,  $SD = 2.17$ ) and felt confident in the kitchen ( $M = 9.48$ ,  $SD = 2.09$ ).

There was moderate agreement that RDNs are adequately prepared to be independent providers of CM ( $M = 7.34$ ,  $SD = 2.55$ ) and that CM will help patients achieve a healthy weight status ( $M = 8.50$ ,  $SD = 2.21$ ). There was low agreement that CM can be taught by any health practitioner ( $M = 5.20$ ,  $SD = 2.56$ ) and that the participants' education and training adequately prepared them to provide CM education ( $M = 6.61$ ,  $SD = 2.56$ ).

**Table 4: Registered Dietitian Nutritionists' Attitudes About Culinary Medicine**

---

Scale: 1 = n/a, 2 = strongly disagree, 11 = strongly agree

---

	<i>Mean +/- S.D.</i>
I believe CM is important in the education of dietetics students.	9.82 +/- 1.75
I believe my education and training have adequately prepared me to provide CM education.	6.61 +/- 2.56
I believe patients who practice the principles of culinary medicine will increase their fruit and vegetable intake.	9.23 +/- 1.73
I believe culinary medicine interventions have the potential to change dietary intake.	9.73 +/- 1.54
I believe teaching culinary medicine to my patients will help them achieve a healthy weight status.	8.50 +/- 2.21
I believe speaking with patients about how food and cooking can support their health is an essential part of any discussion about health.	9.88 +/- 1.49

**Table 4: Registered Dietitian Nutritionists' Attitudes About Culinary Medicine**

I believe cooking skills are declining in the US.	8.71 +/- 2.33
I believe culinary medicine's potential as an effective disease management strategy is supported by a sufficient evidence basis.	8.68 +/- 2.17
I believe it is possible to offer recipes that taste good and are nutritious.	10.68 +/- 0.79
I believe taste affects compliance with a specific diet.	10.34 +/- 1.38
I believe that without practicing culinary medicine, my clients would have trouble managing their condition.	8.42 +/- 2.08
I enjoy cooking.	9.47 +/- 2.16
I feel confident in the kitchen.	9.48 +/- 2.09
As an RDN, I am responsible for educating patients/clients about culinary topics.	9.04 +/- 2.08
Culinary medicine can be taught by any health practitioner.	5.20 +/- 2.55
Culinary medicine is best taught by an RDN.	9.13 +/- 2.01
I believe RDNs are adequately prepared to be independent providers of culinary medicine.	7.34 +/- 2.54

The behavior questions, as described in Table 5 below, asked how often the respondent engaged in certain activities related to culinary medicine in their patient interactions or in their work. Answer options were n/a, never, rarely, sometimes, frequently, or always. Nearly 35% (n = 61) answered that they only sometimes included CM in patient education. Almost 30% (n = 51) reported that they never provided CM education using cooking demonstrations but did frequently provide recipes to patients/clients (30.9%, n = 54). Thirty-six percent (n = 63) reported they frequently offered advice on how to modify recipes. Further, 22% (n = 38) reported that CM interventions were only sometimes part of their organization's program development.



**Table 5: Registered Dietitian Nutritionist Behaviors in Culinary Medicine at Work**

	<i>n (%)</i>				
	Never	Rarely	Sometimes	Frequently	Always
I include culinary medicine in patient/client education.	7 (4.0%)	14 (8.0%)	61 (34.9%)	41 (23.4%)	18 (10.3%)
I provide culinary medicine education to my patients using cooking demonstrations.	51 (29.1%)	33 (18.9%)	28 (16.0%)	18 (10.3%)	7 (4.0%)
I provide recipes to my patients/clients.	8 (4.6%)	13 (7.4%)	44 (25.1%)	54 (30.9%)	23 (13.1%)
I offer advice on how to modify recipes.	2 (1.1%)	9 (5.1%)	50 (28.6%)	63 (36.0%)	21 (12.0%)
Culinary medicine interventions are a part of my organization's program implementation.	25 (14.3%)	30 (17.1%)	38 (21.7%)	22 (12.6%)	15 (8.6%)

Respondents were also asked how often they provided CM advice for specific conditions (Table 6 below). The highest reported as frequently or always offered were diabetes (34.9%, n = 61; 23.4%, n = 41), heart disease (29.7%, n = 52; 20.6%, n = 36), obesity (31.4%, n = 55; 21.7%, n = 38), and hypertension (32.6%, n = 57; 19.4%, n = 34). The highest reported conditions for which RDNs never offered CM advice were peptic ulcer disease (13.1%, n = 23), kidney disease in need of dialysis (10.3%, n = 18), and hyperuricemia (10.3%, n = 18).

**Table 6: Conditions in Which Registered Dietitian Nutritionists Use Culinary Medicine**

Frequency of offering CM advice based on diagnosis

	<i>n (%)</i>				
	Never	Rarely	Sometimes	Frequently	Always
Kidney disease not requiring dialysis	16 (9.1%)	13 (7.4%)	35 (20.0%)	26 (14.9%)	15 (8.6%)
Kidney disease in need of dialysis	18 (10.3%)	13 (7.4%)	24 (13.7%)	24 (13.7%)	22 (12.6%)
Liver disease	16 (9.1%)	21 (12.0%)	32 (18.3%)	23 (13.1%)	11 (6.3%)
Diabetes	2 (1.1%)	6 (3.4%)	24 (13.7%)	61 (34.9%)	41 (23.4%)
Peptic ulcer disease	23 (13.1%)	21 (12.0%)	32 (18.3%)	19 (10.9%)	12 (6.9%)
Anemia	17 (9.7%)	25 (14.3%)	39 (22.3%)	22 (12.6%)	15 (8.6%)
Dyslipidemia	13 (7.4%)	10 (5.7%)	37 (21.1%)	38 (21.7%)	27 (15.4%)
Hyperuricemia, gout	18 (10.3%)	31 (17.7%)	35 (20.0%)	10 (5.7%)	12 (6.9%)
Heart disease	3 (1.7%)	8 (4.6%)	27 (15.4%)	52 (29.7%)	36 (20.6%)
Obesity	6 (3.4%)	2 (1.1%)	34 (19.4%)	55 (31.4%)	38 (21.7%)
Hypertension	6 (3.4%)	5 (2.9%)	30 (17.1%)	57 (32.6%)	34 (19.4%)
Constipation	7 (4.0%)	11 (6.3%)	46 (26.3%)	43 (24.6%)	24 (13.7%)
Diarrhea	9 (5.1%)	20 (11.4%)	39 (22.3%)	40 (22.9%)	14 (8.0%)
Cancer	16 (9.1%)	17 (9.7%)	28 (16.0%)	33 (18.9%)	13 (7.4%)
Food insecurity	12 (6.9%)	22 (12.6%)	41 (23.4%)	38 (21.7%)	18 (10.3%)

## Discussion

The Academy of Nutrition and Dietetics (the Academy) publishes a Compensation and Benefits Survey every year to understand basic demographics about RDNs, including information on wages, age, race, ethnicity, gender, and primary work site.<sup>6</sup> In 2021, a total of 6,314 RDNs responses were recorded (an 18% response rate) and this survey is considered a surrogate reflection of RDN demographics.<sup>36</sup> The Compensation and Benefits Survey was used to determine how closely RDNs surveyed for this project reflect the Academy's findings. The data in this project closely resembles data from the Academy, which suggests that respondents to this survey reflect the RDN population.

Overall, the data suggest an improvement in culinary knowledge, skills, and activities among RDNs. When compared to the 2001 study, there is a significant improvement in the percentage of RDNs who provide recipes to patients and who offer advice for recipe modifications.<sup>28</sup> When compared to the CDR entry-level surveys, the data reported here gives a more detailed and precise look at culinary activities.<sup>13,14</sup> The data suggest that RDNs see the value in cooking and CM education. They agree that taste affects compliance with therapeutic diets and that CM education can potentially change dietary intake. However, their ability to use CM is hindered by available resources like teaching kitchens, and their overall use of CM strategies for patient interventions is not at the level it could be, especially considering that the RDNs strongly agreed that they feel confident in the kitchen and enjoyed cooking. This discussion explores the possible explanations for the disconnect between the perceived value of cooking and the actual time spent teaching it to patients.

The literature review revealed a lack of cooking education in schools, a decline in interest in cooking over the past 30 years, and an arguable loss of generational teaching of cooking

skills.<sup>9,11</sup> RDNs may be the first to teach patients about cooking skills. However, RDNs have also strayed from the kitchen and may not be equipped to provide much-needed interventions. For a profession that revolves around food and nutrition intake, the percentage of respondents who received no basic culinary skills training in any educational setting is high. The RDNs surveyed here agreed that cooking skills are an important part of dietetic education, yet a significant number of respondents also reported no education in any setting on pantry shopping, knife skills, recipe development, or batch cooking. The results showing that RDNs were less confident that their education and training adequately prepared them to provide CM education to their patients are understandable in this context. These skills can be enormously useful in helping patients meal plan, budget, and cook creatively. They can turn nutrition advice into action. The literature agrees that CM can improve self-efficacy of cooking behaviors, and common nutrition advice encourages patients to eat at home to save money, improve nutrition, and reduce total calorie intake.<sup>6</sup> All dietetic students should graduate from their programs and their supervised practice having received education on these basic skills.

Coursework in academic programs has changed over the years. Before 2001, food preparation skills were primarily taught from a food science perspective.<sup>37</sup> Food science is defined as the “understanding of the chemistry of food components, such as proteins, carbohydrates, fats, and water and the reactions they undergo during processing and storage.”<sup>38p.1</sup> Much of it focuses on maintaining a safe and adequate food supply.<sup>39</sup> While food science is important and useful, it is not the skill set that RDNs need to help their patients since it does not explore the relationship between nutrition and disease. Most of the RDNs surveyed here reported receiving a food science education, which also aligns with the high percentage who graduated from their accredited program before 2001, when food science was still the primary way to teach

food skills.<sup>37</sup> These RDNs were not taught other culinary skills, which may explain why some did not feel confident providing CM education to patients. As these RDNs progress in their careers and become preceptors for younger students, they do not necessarily have the experience to pass on the knowledge of cooking education for patients. Fortunately, the dietetics curriculum is shifting from a food science focus, where now students are taught food preparation from a culinary nutrition or CM perspective.<sup>40</sup>

Dietetics coursework has improved but is still lacking in food preparation competencies. For graduate-level Future Education Model students, only three of the 37 competencies cover food preparation specifically.<sup>40</sup> For Didactic Programs in Dietetics, eight standards cover 25 different competencies and only one covers all the required food preparation techniques.<sup>41</sup> Dietetic Internship programs only have two food-related competencies, and they are more closely related to management skills than food preparation skills.<sup>41</sup> Given this lack of attention to culinary education for disease prevention and the clinical focus of internships, dietetic students are perhaps not given adequate opportunity to practice CM-related skills with patients and, therefore, might be less likely to use them in their jobs. The results here support this claim. There is a significant drop off in nearly all culinary skills disciplines once students get to their supervised practice rotations. Batch cooking was the only topic that more participants reported receiving education on in practice rotations than in the classroom or lab.

A majority of the RDNs in this study continued working in the clinical arena and in venues that were not well-equipped to help RDNs deliver culinary interventions.<sup>36</sup> After teaching kitchens, the most common CM facilities reported in this survey were conference rooms and the RDN's home kitchen. A conference room suggests that the RDN cannot teach CM to its fullest potential, given the requirement to bring cooking equipment in and out. For the RDN at home,

this venue suggests that they were relying on their own resources, rather than their employer's resources, to teach valuable cooking lessons. Overall, the accessibility of appropriate facilities for CM interventions appears low, which may further explain some RDNs' lack of offering regular CM education.

The management rotation is an ideal venue to continue the culinary learning done in the didactic setting. Outpatient rotations may also present a variety of CM opportunities from increased sharing of cooking resources with individual patients to group lessons with hands-on cooking demonstrations. The completion of student learning experiences to achieve competency in both the management and outpatient rotations could include cooking demonstrations or culinary skills workshops such as meal planning, batch cooking, or pantry shopping.

More data is needed on the biometric outcomes of CM interventions, which aligns with the results found here, where RDNs only moderately agreed that CM is supported by a sufficient evidence basis. One small, randomized control trial demonstrated that CM interventions can reduce HbA1c, cholesterol, and blood pressure in patients with diabetes living in food deserts.<sup>42</sup> Expanding research into these outcomes could have significant long-term benefits for patients. RDNs would have more evidence-based reasoning to include CM in their practice and ideally reduce the burden of the chronic diseases they frequently treat, including diabetes, heart disease, hypertension, and obesity. Research suggests that CM has a promising future in healthcare. RDNs can and should be leaders in CM interventions. RDNs surveyed here agree that CM is best taught by an RDN rather than another healthcare professional. This project reveals more precisely how this objective can be accomplished.

## Strengths and Limitations

The strengths of this study include the initial content and face validity processes for the survey tool. Establishing initial content and face validity for the survey tool ensures that the survey accurately reflects the variables of interest and the survey is understandable to the participants.<sup>34</sup> Another strength of the project is the use of the Academy's General Registry List. Access to this list allows for a large, randomly selected sample size and reduces the potential for selection bias of participants. The respondents to this survey reflect Academy data on RDN demographics, including gender, race, ethnicity, work setting, wage, and education.<sup>36</sup> This survey also provides more information about RDNs' cooking and culinary activities than the CDR survey of entry-level RDNs.<sup>13</sup>

The inherent limitations of cross-sectional study designs include the inability to track RDNs' attitudes and behaviors in CM over time; this project can only reflect one point in time.<sup>34</sup> There is the potential for respondents to misinterpret the questions, however the survey did include brief instructions and definitions to avoid misconceptions. The demographic question about the primary work setting revealed a limitation. The most frequent response for primary work setting, approximately 23%, was "other" with no option to write in. There is no way to determine where these RDNs worked. Three questions in the survey that included a "none of the above" option. However, when respondents selected this answer, an error in Qualtrics settings did not track this response.

## Conclusions

The data reported here suggests an improvement in RDNs' culinary knowledge and skills when compared to the 2001 survey.<sup>28</sup> RDNs see the value in CM but may not necessarily regularly provide it because of a perceived lack of adequate education in the topic and lack of exposure to CM in supervised practice. The data indicated a significant drop in culinary education once students get to supervised practice. Decisions to include more CM training in the supervised practice setting may increase the likelihood of RDNs providing the interventions to their patients. The literature suggests low involvement in cooking skills in the general population and the RDN may be the first person to intervene and promote cooking competence. With additional research on biometric outcomes, CM could be a meaningful and long-term intervention to alleviate the risks of chronic diseases that RDNs so frequently see and provide a stronger evidence-basis to compel the inclusion of culinary skills in entry-level RDN education requirements. This project revealed more precisely how RDNs are involved in CM and provides insight into areas for improvement.



## **Dietetics and Nutrition Practice Implications**

There are numerous implications in this project for dietetics education, research, and practice. For education, this project revealed that CM education drops off after students leave the didactic setting. Extending CM skill building into the management and outpatient supervised practice rotations could increase the likelihood that the RDN will use it in their professional practice.

Regarding research implications, this project established stronger baseline knowledge for how involved RDNs are in CM. Further research on this topic should focus on what primary roadblocks RDNs face when implementing CM, whether it is counseling strategies, education competencies, or workplace barriers. Biometric outcomes of CM interventions are also needed. Further research on this topic should ask RDNs who else on the healthcare team supports the RDN in CM activities.

In terms of practice implications, this project expanded knowledge of how CM fits into current RDNs' practice and how they do or do not use it. This project establishes a current baseline of culinary activities in nutrition and dietetics practice beyond the entry-level practice activities reported by the CDR survey and more accurately describes the role of the RDN in culinary medicine.<sup>12</sup> Continuing education courses could be an accessible way for RDNs to improve their CM knowledge and support implementation in their practice. RDNs could start asking their patients more detailed about their cooking activities going forward, as it may be a useful avenue to explore behavior change strategies.

## References

1. La Puma J. What is culinary medicine and what does it do? *Popul Health Manag.* 2016;19(1):1-3. doi:10.1089/pop.2015.0003
2. Irl B H, Evert A, Fleming A, et. al. Culinary medicine: advancing a framework for healthier eating to improve chronic disease management and prevention. *Clin Ther.* 2019;41(10):2184-2198. doi:10.1016/j.clinthera.2019.08.009
3. Academy of Nutrition and Dietetics. About RDNs and NDTRs. EatRightPRO. Accessed January 1, 2023. <https://www.eatright.org/about-rdns-and-ndtrs>
4. Andersen D, Baird S, Bates T, et. al. Academy of Nutrition and Dietetics: revised 2017 scope of practice for the registered dietitian nutritionist. *J Acad Nutr Diet.* 2018;118(1):141-165. doi:10.1016/j.jand.2017.10.002
5. Barkoukis H, Swain J, Rogers C, et. al. Culinary medicine and the registered dietitian nutritionist: time for a leadership role. *J Acad Nutr Diet.* 2019;119(10):1612-1611. doi:10.1016/j.jand.2019.01.012
6. Hasan B, Thompson WG, Almasri J, et. al. The effect of culinary interventions (cooking classes) on dietary intake and behavioral change: a systematic review and evidence map. *BMC Nutr.* 2019;5(29). doi:10.1186/s40795-019-0293-8
7. Erickson-Weerts S. Past, present, and future perspectives of dietetics practice. *J Am Diet Assoc.* 1999;99(3):291-293.
8. Krieger E. 2013 Lenna Frances Cooper memorial lecture: bringing cooking back: food and culinary expertise as a key to dietitians' future success. *J Acad Nutr Diet.* 2014;114(2):313-319.
9. Wolfson JA, Bleich SN, Smith KC, Frattaroli S. What does cooking mean to you?: perceptions of cooking and factors related to cooking behavior. *Appetite.* 2016;97:146-154.
10. Paulin, GD. Meal appeal: patterns of expenditures on food away from home. Bureau of Labor Statistics. April 2020. Accessed February 10, 2022. <https://www.bls.gov/spotlight/2020/food-away-from-home/home.htm>
11. Smith LP, Ng SW, Popkin BM. Trends in US home food preparation and consumption: analysis of national nutrition surveys and time use studies from 1965-1966 to 2007-2008. *Nutr J.* 2013;12:45. doi:10.1186/1475-2891-12-45
12. Taillie LS. Who's cooking? trends in US home food preparation by gender, education, and race/ethnicity from 2003 to 2016. *Nutr J.* 2018;17(1):41.
13. Rogers D, Griswold K, Sauer KL, et. al. Entry-level registered dietitian and dietetic technician, registered practice today: results from the 2020 Commission on Dietetic Registration entry-level dietetics practice audit. *J Acad Nutr Diet.* 2021;121:330-378.

14. Griswold K, Rogers D, Sauer KL, Kellogg Leibovitz P, Finn JR. Entry-level dietetics practice today: results from the 2015 Commission on Dietetic Registration entry-level dietetics practice audit. *J Acad Nutr Diet.* 2016;116(10):1632-1684.
15. Ward B, Rogers D, Mueller C, Touger-Decker R, Sauer KL. Entry-level dietetics practice today: results from the 2010 Commission on Dietetic Registration entry-level dietetics practice audit. *J Am Diet Assoc.* 2011;111(6):914-941.
16. Rogers D, Fish JA. Entry-level dietetics practice today: results from the 2005 Commission on Dietetic Registration entry-level dietetics practice audit. *J Am Diet Assoc.* 2006;106(6):957-964.e22.
17. Cooper MJ, Mezzabotta L, Murphy J. Food and culinary knowledge and skills: perceptions of undergraduate dietetic students. *Can J Diet Pract Res.* 2017;78(1):42-44. doi:10.3148/cjdpr-2016-026
18. Begley A, Gallegos D. Should cooking be a dietetic competency? *Nutr & Diet.* 2010;67(1):41-46.
19. Downer S, Berkowitz SA, Harlan TS, Olstad DL, Mozaffarian D. Food is medicine: actions to integrate food and nutrition into healthcare. *BMJ.* 2020;369:m2482. doi:10.1136/bmj.m2482
20. Raber M, Chandra J, Upadhyaya M, et. al. An evidence-based conceptual framework of healthy cooking. *Prev Med Rep.* 2016;4:23-28.
21. Cooking Matters. Everyone deserves delicious, healthy food. Accessed April 8, 2022. <https://cookingmatters.org/>
22. Mcmanus CR, Barkoukis H, Kim R, Nguyen J. 907-P: Diabetes-inspired culinary education (DICE): an innovative approach to type 1 diabetes management through culinary medicine. *Diabetes (New York, N.Y.).* 2021;70(suppl 1):907. doi:10.2337/db21-907-P
23. Delichatsios HK, Hauser ME, Burgess JD, Eisenberg DM. Shared medical appointments: a portal for nutrition and culinary education in primary care—a pilot feasibility project. *Glob Adv Health Med.* 2015;4(6):22-26.
24. Magallanes E, Sen A, Siler M, Albin J. Nutrition from the kitchen: culinary medicine impacts students' counseling confidence. *BMC Med Educ.* 2021;21(1):88. doi:10.1186/s12909-021-02512-2
25. Burch E, Crowley J, Laur C, Ray S, Ball L. Dietitians' perspectives on teaching nutrition to medical students. *J Am Coll Nutr.* 2017;36(6):415-421. doi:10.1080/07315724.2017.1318316
26. Hark LA, Deen D. Position of the Academy of Nutrition and Dietetics: interprofessional education in nutrition as an essential component of medical education. *J Acad Nutr Diet.* 2017;117(7):1104-1113.
27. Mauriello LM, Artz K. Culinary medicine: bringing healthcare into the kitchen. *Am J Health Promot.* 2019;33(5):825-829. doi:10.1177/0890117119845711c

28. Zwick-Hamilton SI, Braves-Fuller A. Perceived attitudes of dietitians in culinary skills competency. *J Acad Nutr Diet.* 2001;101(9)A-16. doi:10.1016/S0002-8223(01)80030-4
29. McWhorter JW, Danho MP, LaRue DM, et. al. Barriers and facilitators of implementing a clinic-integrated food prescription plus culinary medicine program in a low-income food insecure population: a qualitative study. *J Acad Nutr Diet.* 2022;122(8):1499-1513.
30. Nunez K. *The Effects of a Nutrition Education Intervention on Supervised Practice Students' Meal Preparation Attitudes and Behaviors.* Graduate project. University of Alaska Anchorage; 2022.
31. Cooper S, Begley A. WA health practitioners and cooking: how well do they mix? *Nutr & Diet.* 2011;68:65-69. doi: 10.1111/j.1747-0080.2010.01494.x
32. Kizaki H, Ota T, Mashima S, et. al. Questionnaire survey investigation of the present status of dietetic consultation at community pharmacies from the perspectives of registered dietitians and pharmacists. *BMC Health Serv Res.* 2021;935. doi:/10.1186/s12913-021-06959-3
33. Commission on Dietetic Registration. CDR staff contacts. CDR. Accessed January 6, 2023. <https://www.cdrnet.org/cdr-staff-contacts>
34. Van Horn L, Beto J. *Research: Successful Approaches in Nutrition and Dietetics.* 4th ed. Academy of Nutrition and Dietetics; 2019.
35. IBM. IBM SPSS statistics grad pack and faculty packs. Accessed March 25, 2022. <https://www.ibm.com/products/spss-statistics-gradpack>
36. Dosedel E. Compensation and benefits survey 2021. *J Acad Nutr Diet.* 2021;121(11):2314-2331. doi:10.1016/j.jand.2021.08.113
37. What is food science? McGill University. Accessed December 5, 2022. <https://www.mcgill.ca/foodscience/what-food-science>
38. What is food science? University of California Davis. Accessed December 5, 2022. <https://foodscience.ucdavis.edu/about/what-food-science>
39. Commission on Accreditation for Dietetics Education. 2002 eligibility requirements and accreditation standards. American Dietetic Association. February 2002.
40. Academy of Nutrition and Dietetics. Future education model standards and templates v2022. EatRightPRO. Accessed December 5, 2022. <https://www.eatrightpro.org/acend/accreditation-standards-fees-and-policies/future-education-model-standards-and-templates-v2022>
41. Academy of Nutrition and Dietetics. 2022 standards and templates. EatRightPRO. Accessed December 5, 2022. <https://www.eatrightpro.org/acend/accreditation-standards-fees-and-policies/2022-standards-and-templates>

42. Monlezun DJ, Kasprowicz E, Tosh KW, et. al. Medical school-based teaching kitchen improves HbA1c, blood pressure, and cholesterol for patients with type 2 diabetes: results from a novel randomized controlled trial. *Diabetes Res Clin Pract.* 2015;109:420-426.

## **Appendix A - Survey of Registered Dietitian Nutritionists' (RDNs) Attitudes and Behaviors in Culinary Medicine and the Role of the RDN**

Screening questions:

1. Are you an RDN? Yes or no
2. Are you over 18 years of age? Yes or no

Demographics:

1. Please indicate your age in years.
  - (Fill-in numeric response)
2. What is your gender identity?
  - Male
  - Female
  - Non-binary
  - Other
  - Prefer not to answer
3. Are you of Hispanic, Latinx, or Spanish origin?
  - Hispanic
  - Latinx
  - Spanish
  - Non-Hispanic, Non-Latinx, non-Spanish origin
  - Prefer not to answer
4. How would you describe your race? (Mark all that apply)
  - Native American Indian or Alaska Native
  - Asian
  - Black or African American
  - Native Hawaiian or Other Pacific Islander
  - White
  - Unknown
  - Other/Prefer to self -describe
  - Prefer not to answer
5. Please indicate the highest degree program completed.
  - Bachelor's Degree
  - Graduate Degree (Master's, PhD)
  - Professional Degree (MD/DO, JD, etc.)

6. On average, how many hours do you work?
  - Full-time (30-40 hours per week)
  - Part-time (0-29 hours per week)
  - Leave of absence (medical leave, maternity leave, etc.)
  - Retired
  - Extended sick leave or disability
  - Other
  
7. Please indicate your current income level.
  - Under \$20,000
  - \$20,001 - \$40,000
  - \$40,001 - \$60,000
  - \$60,001 - \$80,000
  - \$80,000 - \$100,000
  - \$100,001 or over
  - Prefer not to answer
  
8. What year did you complete your CADE/ACEND accredited didactic training?
  - Forced numeric response
  
9. What is your primary work setting?
  - Acute care inpatient
  - Acute e-care inpatient
  - Acute care outpatient
  - Acute e-care outpatient
  - Ambulatory/outpatient care facility (clinic, physician's office, primary care, etc.)
  - Long term care
  - Assisted living or group home
  - School nutrition
  - Social services organization
  - College & university dining
  - College, university, or academic medical center
  - Private practice
  - Office
  - Other
  
10. Are you a member of any Dietetic Practice Groups?
  - Yes
  - If yes, please indicate which one(s)\_\_\_\_\_
  - No

For the purposes of this survey, culinary medicine is defined as the practice of combining evidence-based guidelines for health and disease management with the applied art of food and cooking.

### **Culinary Medicine Experience and Education**

1. Please select which culinary activity you received training or education on during your CADE/ACEND accredited training.

	Classroom	Lab	Supervised Practice	All	None
Basic culinary skills					
Menu development (writing menus for foodservice operations)					
Meal planning (planning personal meals for 2 or more days of the week)					
Recipe development (testing and writing new recipes)					
Recipe modification (changing existing recipes for nutrition, serving size, or preferences)					
Pantry shopping (utilizing available ingredients to prepare food rather than shopping for new)					
Knife skills					
Batch cooking					
Food Science					



2. Please indicate the type of culinary medicine activities you have engaged in at your work. Mark all that apply.
  - a. Case study evaluation
  - b. Interdisciplinary delivery of cooking classes
  - c. Cooking demonstrations
  - d. Lead discussion on the therapeutic value of food
  - e. Curriculum development
  - f. Curriculum delivery to dietetic students
  - g. Curriculum delivery to medical students
  - h. Other
  - i. None of the above
  
3. Since receiving your RDN credential, have you pursued continuing education in culinary medicine? (Select all that apply):
  - a. Culinary medicine program (please specify)
  - b. Culinary travel
  - c. Cooking classes
  - d. CEU courses (please specify)
  - e. Other (please specify)
  - f. None of the above
  
4. What culinary medicine facilities do you use? Select all that apply.
  - a. Teaching kitchen
  - b. Conference room
  - c. Commercial kitchen
  - d. Cooking cart
  - e. RDN's home kitchen
  - f. Client/patient's home kitchen
  - g. Food distribution program (food pantry, food bank, soup kitchen, etc.)
  - h. Community food programs (farmer's markets, libraries, etc.)
  - i. School kitchens
  - j. Women, Infant & Children (WIC) program
  - k. Supplemental Nutrition Assistance Program (SNAP)
  - l. Expanded Food and Nutrition Education Program (EFNEP)
  - m. Other (please specify):
  - n. None of the above

## **Attitude**

Please rate your level of agreement with the following statements from 1-10 based on how you feel about these statements, where 1 = strongly disagree and 10 = strongly agree

1. I believe culinary medicine is important in the education of dietetic students.

2. I believe my education and training have adequately prepared me to provide culinary medicine education.
3. I believe patients who practice the principles of culinary medicine will increase their fruit and vegetable intake.
4. I believe culinary medicine interventions have the potential to change dietary intake.
5. I believe teaching culinary medicine to my patients will help them achieve a healthy weight status.
6. I believe speaking with patients about how food and cooking can support their health is an essential part of any discussion about health.
7. I believe cooking skills are declining in the US.
8. I believe cooking skills are an important factor in the prevention of nutrition-related diseases.
9. I believe culinary medicine's potential as an effective disease management strategy is supported by a sufficient evidence basis.
10. I believe it is possible to offer recipes that taste good and are nutritious.
11. I believe taste affects compliance with a specific diet.
12. I believe that without practicing culinary medicine, my clients would have trouble managing their condition.
13. I enjoy cooking.
14. I feel confident in the kitchen.
15. As an RDN, I am responsible for educating patients/clients about culinary topics.
16. Culinary medicine can be taught by any health practitioner.
17. Culinary medicine is best taught by an RDN.
18. I believe RDNs are adequately prepared to be independent providers of culinary medicine.

## **Behaviors**

Please indicate how frequently you conduct the following in your professional practice as an RDN. 0 = n/a 1 = Never 2 = Rarely 3 = Sometimes 4 = Frequently 5 = Always

1. I include culinary medicine in patient/client education.

2. I provide culinary medicine education to my patients/clients using cooking demonstrations.
3. I provide recipes to my patients/clients.
4. I offer advice on how to modify recipes.
5. Culinary medicine interventions are a part of my organization's program implementation.
6. For the following conditions, how frequently do you offer culinary medicine advice? (ie food selection advice, cooking advice, recipe modifications, etc.)

	n/a	Never	Rarely	Sometimes	Frequently	Always
Kidney disease not requiring dialysis	0	1	2	3	4	5
Kidney disease in need of dialysis	0	1	2	3	4	5
Liver disease	0	1	2	3	4	5
Diabetes	0	1	2	3	4	5
Peptic ulcer	0	1	2	3	4	5
Anemia	0	1	2	3	4	5
Dyslipidemia	0	1	2	3	4	5
Hyperuricemia, gout	0	1	2	3	4	5
Heart disease	0	1	2	3	4	5
Obesity	0	1	2	3	4	5
Hypertension	0	1	2	3	4	5
Constipation	0	1	2	3	4	5

	n/a	Never	Rarely	Sometimes	Frequently	Always
Kidney disease not requiring dialysis	0	1	2	3	4	5
Kidney disease in need of dialysis	0	1	2	3	4	5
Liver disease	0	1	2	3	4	5
Diabetes	0	1	2	3	4	5
Peptic ulcer	0	1	2	3	4	5
Diarrhea	0	1	2	3	4	5
Cancer	0	1	2	3	4	5
Food Insecurity	0	1	2	3	4	5

Would you like to be entered into a random drawing to win one of four \$25 Amazon.com e-gift cards? Selecting yes will bring you to a separate survey to enter the drawing. Selecting no will conclude this survey.

- Yes
- No

### **Survey for Random Drawing for Incentive**

If you would like to participate in a random drawing to win one of four \$25 Amazon.com gift cards, please provide the following information:

Name:

Email address:

You will be notified via email if your name was randomly selected. Thank you for your participation!

### Appendix B - Original and Modified Survey Questions

#	Original Question	Modified Question	Citation
	<b>Culinary Medicine Experience and Education</b>		
1	Please indicate the type of education received during your ACEND accredited didactic training regarding meal preparation. Mark all that apply.	Please select which culinary activity you received training or education on during your CADE/ACEND accredited training.	30
2	Please indicate the type of culinary medicine activities you have engaged in at your work. Mark all that apply.		Self
3	Since receiving your RDN credential, have you pursued continuing education in culinary medicine? (Select all that apply):		Self
4	What culinary medicine facilities do you use?		Self
	<b>Attitudes</b>		
1	I believe culinary medicine is important in the education of dietetic students.		Self
2	I believe my education and training have adequately prepared me to provide meal preparation education.	I believe my education and training have adequately prepared me to provide culinary medicine education.	30
3	Meal preparation correlates with higher fruit and vegetable intakes.	I believe patients who practice the principles of culinary medicine will increase their fruit and vegetable intake.	30
4	Cooking skill interventions have the potential to change dietary intake.	I believe culinary medicine interventions have the potential to change dietary intake.	31
5	Meal preparation correlates with a healthy weight status.	I believe teaching culinary medicine to my patients will help them achieve a healthy weight status.	30
6	Speaking with patients about their	I believe speaking with patients about	24

	food choices is an essential part of any discussion about health.	how food and cooking can support their health is an essential part of any discussion about health.	
7	Cooking skills are declining in Western Australia.	I believe cooking skills are declining in the US.	31
8	Cooking skills are an important factor in the prevention of nutrition-related disease.	I believe cooking skills are an important factor in the prevention of nutrition-related disease.	31
9	I believe culinary medicine's potential as an effective disease management strategy is supported by a sufficient evidence basis.		Self
10	It is possible to offer recipes that taste good and are nutritious.	I believe it is possible to offer recipes that taste good and are nutritious.	28
11	Taste affects compliance to a specific diet.	I believe taste affects compliance with a specific diet.	28
12	Without the inclusion of meal preparation, my future client would have trouble meeting their recommended nutrient intake.	I believe that without practicing culinary medicine, my clients would have trouble managing their condition.	30
13	I enjoy cooking and feel confident in the kitchen.	I enjoy cooking.	24
14	I enjoy cooking and feel confident in the kitchen.	I feel confident in the kitchen.	24
15	I am responsible for educating others about culinary topics.	As an RDN, I am responsible for educating others about culinary topics.	28
16	Culinary medicine can be taught by any health practitioner.		self
17	Culinary medicine is best taught by a dietitian.		self
18	I believe RDNs are adequately prepared to be independent providers of culinary medicine.		self

	<b>Behaviors</b>		
1	As a registered dietitian nutritionist, I will include meal preparation nutrition education because it is a vital component of my patient's nutrition education.	I include culinary medicine in patient/client education.	30
2	As a registered dietitian nutritionist, I will teach meal preparation nutrition education to my patients using menu planning demonstrations.	I provide culinary medicine education to my patients using cooking demonstrations.	30
3	I receive requests for recipes, techniques, and actual methods for how to modify recipes.	I provide recipes to my clients/patients.	28
4	I routinely provide recipes, techniques, and actual methods for how to modify recipes.	I offer advice on how to modify recipes.	28
5	Cooking skill interventions are a significant part of my organization's program implementation.	Culinary medicine interventions are a significant part of my organization's program implementation.	31
6	Please select the most appropriate frequency of dietetic consultation for patients with various diseases.	For which conditions do you most commonly offer culinary medicine advice? (ie cooking advice, recipe modifications, etc.) Mark all that apply. [Chart is the same]	32

## Appendix C - Survey Cover Letter

Dear Registered Dietitian Nutritionist,

My name is Ellen McEwen. I am a graduate student in the Dietetics and Nutrition program at the University of Alaska Anchorage (UAA), School of Allied Health. I would like to invite you to participate in a research study focused on culinary medicine. The purpose of the research study is to assess RDNs' attitudes and behaviors in culinary medicine and the role of the RDN.

All participants who complete the survey will be offered an opportunity to be entered into a random drawing for one of four \$25 Amazon.com gift cards.

You may take part in this study if you:

- Are 18 years or older
- Are a registered dietitian nutritionist
- Have an active registration with the Commission on Dietetic Registration (CDR)
- Have approximately 15 minutes to complete the survey

There are no known risks for participating in this study except for the remote possibility that your e-mail address would be inadvertently disclosed. However, the principal investigator has put in place adequate protection for your privacy and data. By participating you are voluntarily agreeing to consent to this research study and giving your permission to use your responses in aggregate form for research purposes.

Your responses will not be shared with anyone outside of the study. Your responses to the survey are confidential. This project was reviewed by the UAA Institutional Review Board and found to qualify for Exemption 2.ii.

I will send out a follow-up e-mail one week and two weeks following this e-mail to encourage participation in the study. This survey will be open from August 31, 2022 to September 14, 2022.

The aggregate results of this study will be e-mailed to participants, upon request, once the study is completed.

If you have any questions regarding this study, feel free to contact me (eemcewen@alaska.edu and 406-461-1896) or my committee chair, Carrie King PhD, RD, LD, CDCES (cdking@alaska.edu and 907-786-6597). If you have any questions about your rights as



a research participant, please contact the UAA Office of Research Integrity and Compliance at 907-786-1099 or [uaa\\_oric@alaska.edu](mailto:uaa_oric@alaska.edu).

Please complete the following steps if you would like to enroll in this study:

1. To confirm your eligibility and for information on how to participate in this study complete the screening process available in the link at the end of this page.
2. If you meet the study eligibility criteria, decide if you want to participate in the study.
3. If you agree to participate you will be asked to complete a survey that will take approximately 15 minutes to complete. Upon completion of the survey, you will have the opportunity to be entered into a random drawing for one of four \$25 Amazon.com e-gift cards.

Thank you very much for considering this opportunity.

Sincerely,

Ellen McEwen  
Graduate Student  
University of Alaska Anchorage, School of Allied Health, Dietetics and Nutrition

Graduate Advisor:  
Carrie King, PhD, RD, LD, CDCES  
Professor, Dietetics & Nutrition  
Director, UAA Dietetic Internship and Future Graduate Program

## **Appendix D - Informed Consent**

### **Principal Investigator:**

Ellen McEwen

Graduate Student, University of Alaska Anchorage, School of Allied Health

(406) 461-1896

E-mail: [eemcewen@alaska.edu](mailto:eemcewen@alaska.edu)

### **Research Supervisor:**

Carrie King, PhD, RD, LD, CDCES

Professor, Dietetics & Nutrition

Director, UAA Dietetic Internship and Future Graduate Program

Phone: (907) 786-6597

E-mail: [cdking@alaska.edu](mailto:cdking@alaska.edu)

### **DESCRIPTION:**

I am conducting research about the attitudes and behaviors of Registered Dietitian Nutritionists (RDNs) and the role of the RDN in culinary medicine.

I will ask you to complete a confidential survey. The survey asks some basic questions about who you are (your age and gender, for example), your nutrition education, and your current employment. You will be asked to assess your attitudes and behaviors in culinary medicine and the role of the RDN.

### **VOLUNTARY NATURE OF PARTICIPATION:**

Your participation in this study is voluntary and is not a requirement. If you don't wish to participate, or would like to end your participation in this study, there will be no penalty or loss of benefits to you to which you are otherwise entitled. In other words, you are free to make your own choice about being in this study or not, and may quit at any time without penalty.

### **CONFIDENTIALITY:**

No names or identifiers will be published. While we will have your contact information and your survey responses, we will not link these and they will be held in confidence. The results of the survey will be compiled and reported in aggregate form. No individual reporting of surveys will be done.

### **BENEFITS AND INCENTIVES TO PARTICIPANTS:**

There is no direct benefit to you from participating in this study. The results of this study may benefit other people by helping us learn about the role of the RDN in culinary medicine.

Upon completion of the survey, all participants will have the opportunity to be entered into a random drawing for one of four \$25 Amazon.com e-gift cards.

**RISKS:**

There are no known risks for participating in this study except for the remote possibility that your e-mail address would be inadvertently disclosed. However, the principal investigator has put in place adequate protection for your privacy and data. The Academy of Nutrition and Dietetics (the Academy) manages the communications with potential participants. This information could be used by the Academy to build customer profiles.

**CONTACT PEOPLE:**

If you have any questions about this research, please contact the Principal Investigator at the phone number listed above. If you have any questions or concerns about your rights as a research participant, please contact UAA Office of Research Integrity and Compliance at 907-786-1099 or [uaa\\_oric@alaska.edu](mailto:uaa_oric@alaska.edu).

**CONSENT:**

Please print a copy of this page, take a screenshot with your device, or save a copy of this form in some way for your future reference.

By clicking the continue button below, you are showing that you understand what this study is about. You are also showing that you understand what we are asking you to do for the study, and that you are continuing voluntarily. If you have any questions about this study you can contact the researchers listed above.

## **Appendix E - University of Alaska Anchorage Dietetics and Nutrition Faculty Content Validity Email**

Dear DN Faculty,

I am writing to you to request your participation in a content review process. You have been identified as a content expert in the dietetics and nutrition profession.

I am seeking your input on the survey tool for my graduate research project. I am researching the knowledge, attitudes, and behaviors of Registered Dietitian Nutritionists (RDNs) toward their role in culinary medicine.

This survey tool has been developed to understand what food and culinary training RDNs have received throughout their education and how they use it in their careers. It will also assess the attitudes and behaviors of RDNs toward their role in culinary medicine.

The content review process will involve the following steps:

1. Respond to this email that you are interested in participating in the content review process.
2. Review the survey tool.
3. Complete the questionnaire to provide feedback about the survey.

This link will take you to the survey tool and the questionnaire.  
[https://uaa.co1.qualtrics.com/jfe/form/SV\\_5hycrBmLsNhDO8S](https://uaa.co1.qualtrics.com/jfe/form/SV_5hycrBmLsNhDO8S)

I estimate that the content review process will take 20 – 30 minutes.

Completing the content review process will help me detect any unclear areas in the survey tool and provide content validity for my research.

If you have any questions about the content review process, please contact Dr. Carrie King or me.

The favor of your review is requested by Friday, March 25, 2022.

Thank you very much for your consideration of my request to participate in this content review process.

Sincerely,  
Ellen McEwen

## Appendix F - Content Validity and Pilot Study Evaluation Questions

Directions: Please answer the following questions regarding the e-mail invitation to the pilot study and the questionnaire that you just completed. Your suggestions will be used to revise the e-mail and survey. Thank you for your time.

1. Was the e-mail that invited you to participate in the study easy to understand and clear? If no, please explain.  
 Yes  
 No  
Comments:
2. Did you feel that any of the items in the survey were confusing? If yes, please specify which ones.  
 Yes  
 No  
Comments:
3. Do you think that any of the items in the survey lacked any response choices that would have been appropriate? If yes, please specify which ones.  
 Yes  
 No  
Comments:
4. Did you think that the survey flowed in a logical order?  
 Yes  
 No  
Comments:
5. How long did it take you to complete the survey?
6. Do you think that it took too long to complete the survey?  
 Yes  
 No  
Comments:
7. Was there a question that you anticipated but was not asked?
8. How do you feel about the overall quality of the survey?
9. Was the survey visually appealing? If no, please explain.  
 Yes  
 No  
Comments:
10. Please share any comments that we can use to improve the survey.

## Appendix G - University of Alaska Institutional Review Board Approval Letter



**Office of Research**  
UNIVERSITY of ALASKA ANCHORAGE

3211 Providence Drive  
Anchorage, Alaska 99508  
1.907.786.1099  
[www.uaa.alaska.edu/research/oric](http://www.uaa.alaska.edu/research/oric)

DATE: August 8, 2022

TO: Ellen McEwen  
FROM: University of Alaska Anchorage IRB

PROJECT TITLE: [1904274-5] An Assessment of Registered Dietitian Nutritionists' Attitudes and Behaviors in Culinary Medicine and the Role of the RDN

SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVED  
DECISION DATE: August 8, 2022

REVIEW TYPE: Exempt Review  
PROJECT CATEGORY: Exempt 2(ii)  
NEXT REPORT DUE: May 24, 2023  
EXPIRATION DATE:

This letter is in response to your request for IRB and/or ORIC approval of modifications to your currently approved proposal. Your request is hereby granted.

On behalf of the entire Board, I wish you continued success with your study.

George Kamberov, PhD  
Executive Director Compliance and Commercialization  
University of Alaska Anchorage

## Appendix H - Fairbanks Memorial Hospital Dietetics Staff Face Validity Email

Dear FMH Dietitians,

I am writing to you to request your participation in a face review process. You have been identified as a content expert in the dietetics and nutrition profession.

I am seeking your input on the survey tool for my graduate research project. I am researching the attitudes and behaviors of Registered Dietitian Nutritionists (RDNs) in culinary medicine and their role.

This survey tool has been developed to understand what food and culinary training RDNs have received throughout their education and how they use it in their careers. It will also assess the attitudes and behaviors of RDNs in culinary medicine.

The face validity process will involve the following steps:

1. Complete the survey.
2. Complete a questionnaire about the survey tool.

This link will take you to the survey tool and the questionnaire: [https://uaa.co1.qualtrics.com/jfe/form/SV\\_9QPjyQrGvpaMUTQ](https://uaa.co1.qualtrics.com/jfe/form/SV_9QPjyQrGvpaMUTQ).

I estimate that the face validity review process will take 20 – 30 minutes.

Completing the face validity review process will help me detect any unclear areas in the survey tool and provide face validity for my research.

If you have any questions about the content review process, please contact my graduate advisor Dr. Carrie King or me at the contact information listed below.

The favor of a reply is requested by June 3, 2022.

Thank you very much for your consideration of our request to participate in this face validity review process.

Sincerely,  
Ellen McEwen  
[eemcewen@alaska.edu](mailto:eemcewen@alaska.edu)

Carrie King, PhD, RD, LD, CDCES  
[cdking@alaska.edu](mailto:cdking@alaska.edu)

## Appendix I - Student Research Request Application Form



120 South Riverside Plaza, Suite 2100  
Chicago, Illinois 60606-6995  
www.eatright.org

### STUDENT RESEARCH REQUEST FORM For Academy Registry List Use

Submission schedule: February 1, May 1, September 1, November 1

Submit to [surveys@eatright.org](mailto:surveys@eatright.org)

Requests will be considered four times per year and may take up to 60 days from the submission deadline for review and feedback. Should list requests be needed outside of this schedule, you may rent a list from the Academy's marketing company INFOCUS Marketing.

#### Student Applicant (must be for student research)

Name McEwen Ellen E  
(Last) (First) (MI)

Student Member ID 86295265

Mailing Address 1850 Cirrus Ct, North Pole, AK 99705

Phone (406) 461-1896 Email ellenmcewen@gmail.com

I am currently enrolled at University of Alaska Anchorage

Research Faculty/Advisor name Carrie King, PhD, RD, LD, CDCES

Phone (907) 786-6597 Email cdking@alaska.edu

*Submit this application along with the following documents for review by the Academy of Nutrition and Dietetics Council on Research's Survey Review Subcommittee:*

- Letter of support signed by your research advisor/faculty
- Draft survey(s) (Word document)
- Description of your proposed research study methodology and/or survey protocol
- Recruitment text (e.g., cover email or letter that will accompany your survey(s))
- Research Request Evaluation Criteria (please submit your responses on a separate sheet):
  1. Does this research support the Academy's mission and vision?
  2. Does this research support the Academy's strategic plan?
  3. How will this research advance the profession of dietetics?

#### Database Selection:

If the application is approved, the survey will be distributed ONLY for the approved study with approved materials (i.e., an initial invitation email plus a reminder email).

General Registry, up to 5,000 RDNs®




**Academy Registry List Use Agreement:**

Please note that the Academy reserves the right to request additional information upon review of documentation submitted.

I agree to the following terms and conditions:

1. The Academy will manage survey distribution, and the cover email accompanying the survey will include a disclaimer that the research being conducted is student research and is not a study of the Academy.
2. I will disclose the anticipated time to complete the survey in the cover email or letter.
3. I agree to share the final research report with the Academy, by submitting to [surveys@catright.org](mailto:surveys@catright.org). The anticipated completion date is March 2023.

Ellen McEwen		June 28, 2022
Student Applicant Name (printed) and Signature		Date
Carrie King, PhD, RD, LD, CDCES	<small>DocuSigned by:</small> 	June 28, 2022
Academic Program Advisor/Faculty Name (printed) and Signature		Date



UNIVERSITY OF ALASKA ANCHORAGE  
COLLEGE OF HEALTH  
Dietetics & Nutrition  
3211 Providence Drive, PSB 146  
Anchorage, AK 99508-5927  
Phone 907.786.1276  
Fax 907.786.0901

Commission on Dietetic Registration  
120 South Riverside Plaza, Suite 2190  
Chicago, IL 60606

May 26, 2022

Dear CDR,

I am writing this letter to support the CDR database applicant, Ellen McEwen, in her graduate research project. I am her research advisor and Future Graduate Program director at the University of Alaska Anchorage (UAA). I have reviewed her research project proposal in full and her request form for use of the CDR database information. Her project was reviewed by the UAA Institutional Review Board and found to qualify for Exemption 2.ii.

If you have any questions, please contact me at the contact information listed below.

Sincerely,

DocuSigned by:  
*Carrie King*  
C322A82ED085481..

May 26, 2022

Carrie King, PhD, RD, LD, CDCES  
Professor, Dietetics & Nutrition  
Director, UAA Dietetic Internship and Future Graduate Program  
Phone: 907-786-6597  
E-mail: [cdking@alaska.edu](mailto:cdking@alaska.edu)

## Ellen McEwen Research Request Evaluation Criteria Responses

### **1. Does this research support the Academy's and/or CDR's Mission/Vision?**

This research project supports the Academy and CDR's missions and visions. Culinary medicine is a growing area of interest in the healthcare setting.<sup>1</sup> With the help of culinary medicine, patients are taught how to prepare nourishing foods specific to their health condition. Culinary medicine can take traditional nutrition education a step further by empowering patients with buildable skills to prepare foods in unique, healthful, and delicious ways.

As food and nutrition experts, RDNs are well-positioned to be leaders in culinary medicine teaching, patient education, program development, and curriculum development for patients, dietetic students, and other healthcare providers. Culinary interventions have been shown to improve dietary intake and overall attitude and self-efficacy for cooking behaviors, particularly when combined with nutrition education.<sup>2</sup> However, while the RDN is well-versed in the relationship between diet and disease, research currently suggests that they are not at the forefront of culinary medicine.<sup>3</sup> This project will help determine the attitudes and behaviors of RDNs in culinary medicine and the role of the RDN.

### **2. Will this research advance the profession of dietetics?**

Yes, this research will advance the profession of dietetics. The project surveys current RDNs' attitudes and behaviors in culinary medicine in their current practice. It will also ask them to evaluate the role of the RDN in culinary medicine. This project will expand knowledge of how culinary medicine fits into current RDNs' practice and how they do or do not use it. Interest in culinary medicine is growing, and more research is needed to understand how RDNs fit into this emerging practice.<sup>1</sup>

### **3. Does this research support the Academy's and/or CDR's strategic plan?**

This project supports the Academy's strategic plan. Research suggests that culinary interventions improve dietary intake and self-efficacy for cooking behaviors, which supports the Academy's interest in promoting healthful eating to improve population health.<sup>4</sup> Culinary medicine can improve health equity and diversity because of its aims to honor each patient's personal and cultural preferences while still utilizing evidence-based nutrition care.<sup>4</sup>

This project also supports the CDR's strategic plan. This project could establish a baseline of culinary activities in dietetics practice beyond the entry-level practice activities reported by the CDR's Entry-Level Practice Audit and could more accurately describe the role of the RDN in culinary medicine.<sup>5</sup> The project could help reveal the "knowledge, skills, and tasks needed by credentialed practitioners"<sup>6</sup> to support their involvement in culinary medicine.

**4. The sample research survey conforms to generally accepted research survey design Standards.**

The project will use a cross-sectional design, which is a generally accepted research design. The survey will be hosted on Qualtrics, an online survey software hosted by UAA. The survey includes appropriate screener questions to confirm that the participant fits the inclusion criteria, 18 years of age or older, and an RDN. Participants are asked to assess their attitudes and behaviors about culinary medicine, cooking, and patient care. The survey was reviewed for initial content validity by the nutrition and dietetics faculty at UAA. The survey will also be reviewed for initial face validity with a pilot study before implementing the final survey. The pilot study will be conducted with RDNs in Alaska. The pilot study will help fine-tune the survey and provide suggestions for improvements or modifications. A copy of the survey is included in this application packet as Appendix A.

**5. Is your college/university US regionally accredited and accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND)?**

UAA is accredited by the Northwest Commission on Colleges and Universities (NWCCU). The UAA Bachelor of Science degree in Dietetics and the UAA Master of Science degree in Dietetics and Nutrition (UAA Future Graduate Program) are both accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND).

**6. The proposed research study description/methodology conforms with the generally accepted research design standards.**

The project will use a cross-sectional design, which is a generally accepted research design. Participants will be asked to fill out an online survey. Potential participants will be sent three communications. The first will be an introductory email inviting them to participate. There will be two follow-up emails, which will only be sent to participants who have not yet completed the survey. All three communications will include a link to the survey. Before starting the survey, there will be a cover letter to participants further detailing the scope and intent of the project. There is an Informed Consent that participants must agree to before continuing with the survey. At the end of the survey, participants will be offered the opportunity to voluntarily enter into a random drawing for one of four \$25 Amazon.com e-gift cards. All communications to participants are included in this application packet in Appendix B.

**7. Do you have Institutional Board (IRB) approval? If so, please attach documentation.**

This project was reviewed by the UAA IRB and found to qualify for Exemption 2.ii. Documentation is included in this application packet as Appendix C.

### References for Student Research Request Application

1. La Puma J. What is culinary medicine and what does it do? *Popul Health Manag.* 2016;19(1):1-3. doi:10.1089/pop.2015.0003
2. Hasan B, Thompson WG, Almasri J, et. al. The effect of culinary interventions (cooking classes) on dietary intake and behavioral change: A systematic review and evidence map. *BMC Nutrition.* 2019;5. doi: <http://dx.doi.org/10.1186/s40795-019-0293-8>.
3. Barkoukis H, Swain J, Rogers C, et. al. Culinary medicine and the registered dietitian nutritionist: time for a leadership role. *J Acad Nutr Diet.* 2019;119(10):1612 - 1611. doi:<https://doi.org/10.1016/j.jand.2019.01.012>
4. EatRightPRO. The Academy's strategic plan. Accessed May 26, 2022. <https://www.eatrightpro.org/leadership/governance/board-of-directors/strategic-plan>
5. Rogers D, Griswold K, Sauer KL, et. al. Entry-level Registered Dietitian and Dietetic Technician, Registered practice today: results from the 2020 Commission on Dietetic Registration entry-level dietetics practice audit. *J Acad Nutr Diet.* 2021;121:330-378.
6. Commission on Dietetic Registration. About CDR. Accessed May 26, 2022. <https://www.cdrnet.org/about>

## Appendix J - First Recruitment Message

**Email subject line:** Participate in a research study about culinary medicine and a chance to win a \$25 Amazon.com e-gift card!

Dear Registered Dietitian Nutritionist,

Want an opportunity to:

Participate in a study about RDNs in culinary medicine through an online survey?

Be entered to win one of four \$25 Amazon.com e-gift cards?

If you are a registered dietitian nutritionist with an active CDR registration, [click on this link](#). This survey will take approximately 15 minutes and be open from August 31, 2022 to September 14, 2022.

Sincerely,

Ellen McEwen  
Graduate Student  
University of Alaska Anchorage, School of Allied Health, Dietetics and Nutrition

Graduate Advisor:  
Carrie King, PhD, RD, LD, CDCES  
Professor Dietetics and Nutrition  
Director Dietetic Internship and Future Graduate Program

## Appendix K - Follow Up Recruitment Email

**Email subject line:** Participate in a research study about culinary medicine and a chance to win a \$25 Amazon.com e-gift card!

Dear Registered Dietitian Nutritionist,

One week ago, we emailed you an invitation to participate in this study. Your participation in this study is important and valuable. Your contribution would be greatly appreciated.

Want an opportunity to:

Participate in a study about RDNs in culinary medicine through an online survey?

Be entered to win one of four \$25 Amazon.com e-gift cards?

If you are a registered dietitian nutritionist with an active CDR registration, [click on this link](#). This survey will take approximately 15 minutes and be open until September 14, 2022.

Sincerely,

Ellen McEwen  
Graduate Student  
University of Alaska Anchorage, School of Allied Health, Dietetics and Nutrition

Graduate Advisor:  
Carrie King, PhD, RD, LD, CDCES  
Professor Dietetics and Nutrition  
Director Dietetic Internship and Future Graduate Program