

**Integration of Nutrition in the Post-Secondary Culinary Curriculum: Designing a Model**

by

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## Abstract

The present study investigates current nutritional curriculum competencies taught in post-secondary culinary programs and identifies barriers that exist teaching nutrition in post-secondary culinary curriculum. This research was initiated due to the growing consumer demand for foods prepared outside the home coupled with growing concerns over obesity, heart disease, and other related health problems. The significance of this study will allow educators to have current information to accurately integrate nutrition competency into curriculum at the levels deemed needed by industry and stakeholders.

The commercial foodservice industry, a major employer of culinary graduates has become the center of attention due to the fact consumers are eating out more frequently contributing to rapid increases in obesity and related diseases. Consumers are eager for healthier foods selections, fewer calories, and fat, but not at the expense of taste. The U.S. government is taking a proactive stance in ensuring that nutritional concepts are integrated into future U.S. health policies. The government is also beginning to hold the commercial foodservice industry responsible for the foods they produce. The foodservice industry will continue to hire graduates from culinary and hospitality programs; these graduates are expected to be trained to meet the needs of the foodservice industry.

To this end, this study examines and identifies gaps between perceived nutritional curriculum competencies held by stakeholders and the current nutritional competencies followed in post-secondary culinary programs. This research specifically focus on the degree to which nutritional

concepts are being taught in post-secondary culinary curriculum and what barriers currently exist to teaching nutritional concepts in culinary post-secondary curriculum. As a result of findings from this study, based on expert recommendations, a model illustrating the philosophical relationships between nutrition and culinary curricula is developed.

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## Table of Contents

Abstract.....	ii
Acknowledgments.....	iv
List of Tables .....	ix
List of Figures .....	xi
List of Abbreviations .....	xii
Chapter 1 Introduction .....	1
Background of Study .....	1
Statement of Problem .....	5
Purpose of the Study .....	6
Objectives of the Study .....	6
Research Questions .....	7
Research Design .....	7
Significance of the Study .....	9
Definitions .....	10
Organization of the Study.....	12
Chapter 2 Literature Review.....	14
Chapter Introduction .....	14
Challenges Facing the Foodservice Industry .....	14
Consumer Demands for Nutritional Dining Options .....	17

Curriculum .....	19
Role of Educators and Curriculum Development.....	21
Competency in Culinary Education .....	23
Nutritional Content in Culinary Curriculum .....	25
Barriers to Nutrition Design .....	27
Dietetics and Medical Community Approach .....	28
Community Approach/Secondary Approach to Nutrition Education.....	30
Current Level of Nutrition Knowledge.....	32
Government Views on the Importance of Nutritional Effects on Society .....	35
Philosophical Relationship between Nutrition and Curriculum Design.....	37
Summary .....	38
Chapter 3 Methods.....	39
Introduction.....	39
Research Design .....	39
Sampling .....	43
Data Collection .....	44
Phase 1: Delphi Technique Data Collection .....	44
Phase 2: Quantitative Survey Data Collection .....	48
Reliability .....	51
Validity .....	54
Data Analysis.....	56
Summary .....	57
Chapter 4 Results .....	58

Introduction .....	58
Phase 1: Delphi Technique, Grounded Theory .....	59
Description of Participants.....	60
Levels of Consensus using Delphi Technique .....	61
Ranked Level of Importance .....	65
Grounded Theory Development .....	67
Delphi Theme Development and Recommendations .....	69
Phase 2: Quantitative Survey .....	81
Description of Participants .....	81
Research Question 1.....	83
Research Question 2 .....	86
Research Question 3 .....	90
Research Question 4 .....	94
Research Question 5 .....	98
Summary.....	103
Chapter 5 Discussion and Implications.....	104
Introduction.....	104
Summary of Finding .....	104
Discussion.....	107
Research Question 1 Discussion.....	106
Research Question 2 Discussion .....	109
Research Question 3 Discussion.....	111
Research Question 4, 5 Discussion.....	112

Development of a Model: Recommendations.....	114
Implications.....	120
Limitations .....	121
Conclusions.....	122
Directions for Future Research .....	125
Summary.....	130
References.....	128
Appendix 1-Institutional Review Board Approval .....	147
Appendix 2 –Telephone Recruitment Script.....	149
Appendix 3-Delphi Recruitment Letter .....	150
Appendix 4-Educator Recruitment Letter.....	152
Appendix 5-Pilot Study Recruitment Letter .....	153
Appendix 6-Survey Ending Notice Email .....	154
Appendix 7-Delphi Coding Responses.....	155
Appendix 8- Educators Coding Responses .....	158
Appendix 9- Delphi Coding Nutritional Position Statement Responses .....	164
Appendix 10- Survey Instrument .....	167
Appendix 11-Delphi Comment-Responses to Survey Questions .....	177
Appendix 12- Educators Responses to Barriers to Teaching Nutritional Concepts .....	183



## List of Tables

Table 4.1. Demographic Information.....	60
Table 4.2. Delphi Levels of Consensus .....	64
Table 4.3. Ranked Level of Importance. ....	66
Table 4.4. Ranked Level of Needed Integration .....	67
Table 4.5. Delphi Theme Development and Recommendations .....	69
Table 4.6. Educator’s Theme Development and Recommendations .....	71
Table 4.7. Top Seven Themes by Ranking and Frequencies .....	74
Table 4.8. Theme Development and Recommendations .....	77
Table 4.9. Demographic Information.....	81
Table 4.10. ACFEF Nutritional Competencies.....	83
Table 4.11. Results Degree Nutritional Competencies are Taught.....	85
Table 4.12. Results Extent Nutritional Concepts Should be Included.....	87
Table 4.13. Results for Proactive Role in Educating Future Chef/Foodservice Personnel.....	88
Table 4.14. Results Level of Importance for each Competency Level.....	89
Table 4.15. Results Nutritional Concepts Positively Contributes .....	91
Table 4.16. Results How Prepared Post-Secondary Graduates .....	92
Table 4.17. Results for Nutritional Competencies as a Priority.....	93
Table 4.18. Results for Barriers in Teaching .....	95
Table 4.19. Educator’s Response to Barriers Teaching.....	96

Table 4.20. Results ACFEF and ICHRIE Adequacy in Training .....	97
Table 4.21. Results for Foodservice Industry’s Role Fighting Obesity.....	99
Table 4.22. Results Consumers Seeking Healthier Food Selections .....	100
Table 4.23. Results Government’s role in Policy Making .....	101
Table 4.24. Results Degree Nutritional Competencies Integrated .....	102

## List of Figures

Figure 3.1. Research Design Diagram .....	40
Figure 4.1. Consensus Model Diagram .....	63
Figure 4.2. Progression of Coding .....	69
Figure 5.1. Model 1: Level of Nutrition Being Taught .....	107
Figure 5.2. Model 2: Nutrition in Relationship to Curriculum Design .....	109
Figure 5.3. Model 3: Degree to which Nutrition Should be Taught .....	110
Figure 5.4. Model 4: Integration of Nutrition .....	119
Figure 5.5. Model 5: Implications of Nutrition Integration .....	120

## List of Abbreviations

ACFEF	American Culinary Federation Educational Foundation
ICHRIE	International Council on Hotel, Restaurant and Institutional Education
IRB	Institutional Review Board
TDM	Tailored Design Method

## CHAPTER 1. INTRODUCTION

### Background

Currently, Americans are dining out more than ever before. In fact, over half of every dining dollar is spent outside of the home. According to the National Restaurant Association in 2012, Americans spent \$202.2 billion in commercial foodservice establishments (National Restaurant Association, 2013). So it should come as no surprise that previous studies report that there are correlations between various aspects of commercial dining and obesity; this includes a positive correlation between frequency of fast food consumption and obesity (Anderson, Rafferty, Lyon-Callo, & Imes, 2011).

Other research findings demonstrate that obesity has been linked to many medical disorders; namely, an increased risk of diabetes, high blood pressure, high cholesterol, asthma, arthritis, overall poor health status, and premature death (Allison et al., 1999; Fontaine et al., 2003; Mokdad et al., 2003; Hill et al., 2003). The growing consumer demand for commercial foods, in addition to complications arising from obesity, heart disease, and other related health problems, have sparked national campaigns, research projects, and monetary initiatives to overcome these health concerns.

Current literature suggests that it is just a matter of time before lawmakers demand that the restaurant industry take responsibility for their products. In fact, Brownell, Schwartz, Puhl, Henderson, and Harris (2009) state that “support for action to address obesity are influenced by beliefs about culpability for obesity, the role government should play in addressing health problems...understanding how these issues operate, and how to best mobilize social and political

change offer what may be the greatest hope for reducing prevalence” (p. 9). Today, many fast and table service restaurants retailers are facing significant market changes. This is primarily due to the provision of caloric and nutrient information on restaurant menus and boards, a concept proposed at federal, state, and local levels (Burton, Howlett, & Tangari, 2009). Public frustration and eagerness to find a solution to this crisis is likely linked to governmental initiative.

Unfortunately, dining services have often been reluctant to disclose nutrition content because a large portion of the public finds foodservice labeling frustrating and confusing (Almanza, Nelson, & Chai, 1997). As the occurrence of obesity and related health problems increase, blame will be directed at the foodservice industry because their products have negative nutritional and health consequences. This is especially likely because people who frequent these restaurants, in general, already have higher averages of caloric and fat intake and lower averages of fruit, vegetables, and fiber consumption (Saelens, Glanz, Sallis & Frank, 2007). This trend is expected to continue unless there is more emphasis placed upon nutrition in the commercial foodservice industry.

The seriousness of obesity presents an opportunity for hospitality and culinary educators, and the community of stakeholders [such as industry leaders, foodservice providers, consumers, and government officials] to change millions of Americans lives. Increased awareness of this issue has forced foodservice providers to take proactive measures by changing menus to reflect healthier dining options. A growing interest in nutrition, health, and the great amount of people eating away from home has given power and responsibility to retail foodservice operators (Reichler & Dalton, 1998).

This increase in nutritional awareness has already resulted in important changes in the hospitality industry throughout the world (Emenheiser, Chen, Clayton, & Tas, 1999). These

changes should also be implemented in the educational institutions that train future chefs, and other foodservice personal. Current culinary and hospitality students are graduating from their respective institutions at an unprecedented rate. In fact, the number of available programs in the United States has dramatically increased in the past 25 years; approximately 261 schools now offer associate degrees in culinary arts, culinary management, and culinary technology (Hertzman & Ackerman, 2010).

These culinary programs train future chefs to prepare food for the public, but graduated students usually lack nutritional knowledge. According to a study conducted by Hamm, Schnaak, and Janas (1995), “hotel and restaurant management students, in general, have a fairly poor knowledge of nutrition” (p. 1158). However, this is not because students are unwilling; in fact, there is consensus among foodservice students that they do control the nutritional content of their menu items and are willing to learn more about healthier cooking practices (Emenheiser, Chen, Clayton, & Tas, 1999).

The necessity of increasing the nutritional value of menus has become a common topic of discussion for many stakeholders within the foodservice industry. In fact, nutritional education for chefs is crucial if restaurants are to stay competitive. As studies have shown, customers will only accept healthy food if it is aesthetically pleasing and appeals to their palate (Rouslin & Viera, 1998). Awareness of the need for better nutrition is leading consumers to seek healthier alternatives in restaurants (Fitzpatrick, Chapman, & Barr, 1997).

In the study of curriculum design, Lawton (1996) stresses the importance of reflecting on educational philosophy because it determines the whole educational experience. It influences the parts of any course curriculum; i.e. modules, which is specified as course content or syllabi. In fact, according to Chen and Groves (1999), “a statement of goals and objectives expresses what

you wish to do; a philosophy position is a statement on why you want to do it” (p. 37). The philosophical foundation for curricula will not change, whereas courses often do change based on trends within the respective practicing and academic community.

Increasingly, consumer dining habits would indicate that post-secondary culinary curriculum should be revised to reflect the needs of the 21st century. Becket and Brookes (2006) revealed that culinary and hospitality course development has been unable to keep pace with industry needs (p. 127). It is essential to examine the philosophical relationship between nutritional knowledge and curricula design so that academic course foundations are developed to meet current industry needs and future demands. While research in this realm has practical implications for academic and industry stakeholders, it also provides a basis foundation for better understanding how nutrition fits into overall curriculum design.

All stakeholders have a vested interest in strengthening nutrition content in curriculum design. Unfortunately, research indicates that most food personnel possess inadequate knowledge about nutritional content. The Institute of Medicine has identified several barriers to offering healthier options in the foodservice industry, particularly in chef training; namely, insufficient background, inadequate training in nutrition, and recipe modification (Food and Nutrition Board, Institute of Medicine, 1991). Nutrition education and culinary curriculum design is a subject that has received relatively little attention. Moreover, there is limited research literature under key words such as hospitality, foodservice, culinary, nutrition, and curriculum. The majority of research studies addressing nutrition and post-secondary culinary/hospitality curriculum were conducted throughout 1980 to 2000.

However, extensive literature review reveals a number of studies that do address the approaches to curriculum integration in dietetics, medical communities, secondary classrooms,



and community outreach programs that seek to incorporate nutrition content into educational programming. There is now a greater need to fight the rising obesity epidemic; especially given existing evidence on the causes of rising obesity rates and the health benefits from reducing obesity (Yoon & Brown, 2011).

### **Statement of the Problem**

Consumers are eating out more frequently, which has contributed to rapid increases in obesity and related diseases. It has already been established that consumers are eager for healthier foods selections, fewer calories and fat, but not at the expense of taste. The U.S. government is taking a proactive stance in ensuring that nutritional concepts are integrated into future U.S. health policies. The government is also beginning to hold the restaurant industry responsible for their products. The food service and restaurant industry will continue to hire graduates from culinary and hospitality programs. These graduates should be trained to meet the appropriate needs of the food service industry.

Research studies show that culinary and hospitality graduates are not knowledgeable in the area of nutrition. Current post-secondary culinary curriculum fails to reflect the modern challenges of the industry. To help fight the battle against obesity, the food industry must team up with the government, academia, and the medical community to help inform consumers, strengthen nutrition education, and develop healthier product choices (Verduin, Agarwal, & Waltman, 2005). Therefore, stakeholders need current, relevant information to develop curriculum based on a clearly defined philosophical understanding of the nutritional relationship between culinary curricula and its degree of health-related importance.

To date, there have been many studies addressing the role the foodservice industry plays in the rise of obesity. However, there has not yet been a study seeking to investigate the role post-secondary culinary programs may have in the fight against obesity. Consequently, this is a critical time for educators to fulfill its role in the foodservice industry and society in the fight against obesity and related health problems.

### **Purpose of the Study**

The purpose of this study is to identify the philosophical relationships between nutrition and culinary curricula. It will additionally identify gaps between perceived curriculum nutritional needs on the behalf of stakeholders and the actual nutritional curriculum content offered in current programs. Furthermore, this study will reveal barriers of teaching nutritional concepts in post-secondary culinary curriculum. The findings of this study will provide both academic and industry stakeholders a foundation for better understanding how current nutrition content fits into the overall curriculum design and its current level of success. As a result of these findings a model will be developed to illustrate how nutritional concepts could be better integrated into post-secondary culinary curriculum.

Specifically, the objectives of this research are to:

1. Examine the degree to which nutritional concepts are being taught in post-secondary culinary curriculum.
2. Determine the level of awareness current stakeholders possess of how well nutritional concepts are being covered in post-secondary culinary curriculum.

3. Determine to what degree current stakeholders think nutritional concepts positively contribute to reducing obesity in the public foodservice industry?
4. Identify the perceived barriers and gaps of teaching nutritional concepts in post-secondary culinary curriculum.
5. Identify the philosophical relationship between nutrition and culinary curricula based on literature review and participant feedback.

### **Research Questions**

The research questions guiding this study are:

1. To what extent are nutritional concepts and competencies being taught in post-secondary culinary curriculum?
2. To what degree do current stakeholders think nutritional concepts should be taught in post-secondary culinary curriculum?
3. To what degree do stakeholders think knowledge of nutritional concepts positively contribute to reducing obesity in the public foodservice industry?
4. What are the perceived barriers and gaps of teaching nutritional concepts in post-secondary culinary curriculum as identified by current stakeholders?
5. What are the main philosophical relationships between nutrition and culinary curricula?

### **Research Design**

The population for this study consists of two groups that represent a variety of industry professionals. Group 1 (with the use of a Delphi technique) is a panel that is composed of

culinary industry stakeholders: namely, post-secondary culinary educators, and nutrition educators, nutritionist/dietitians. Group 1 includes also foodservice industry professionals; specifically, executive chefs, food service managers, and members of the community representing the restaurant industry. Group 2 consist of post-secondary culinary and hospitality educators who either direct culinary programs and/or teach within programs accredited by the American Culinary Federation. In addition, Group 2 includes International Council on Hotel, Restaurant and Institutional Education (I-CHRIE) educators who direct/teach culinary or hospitality management courses.

This study utilizes a two-phase approach. Phase 1 of the study uses a traditional Delphi technique that is modeled after Mayburry and Swanger (2010). This phase is employed using industry experts to determine necessary nutrition content in post-secondary curriculum. The initial Delphi instrument is derived from relevant literature, post-secondary culinary curriculum and the American Culinary Federation Educational Foundation, ACFEF; an industry recognized accrediting body for accredited culinary programs establishing competencies regarding nutrition and post-secondary culinary curriculum. This research focuses on currently taught nutritional concepts and competencies in post-secondary culinary curriculum in order to illuminate current gaps in culinary education. The text data from this research, both phases, is used to move beyond description to contribute to the development of recommendations that can be used to overcome barriers to integrating nutritional concepts in post-secondary culinary curriculum. And the end goal is to produce a model that explains the philosophical relationships between nutrition and culinary curricula.

The nutritional competencies of the ACFEF which are taught in post-secondary culinary curriculum are used as the baseline for questionnaires. Additionally, perceived barriers and gaps

currently existing in the education of nutritional competency in post-secondary culinary curriculum are examined.

Phase 2 follows a quantitative survey procedure, which uses a tailored design method (TDM) (Dillman, 2000). TDM is the development of survey procedures that create respondent trust and perceptions of increased rewards and reduced costs for being a respondent that take into account features of the survey situation, and that have as their goal the overall reduction of survey error (Dillman, 2000). In this study, it is administered to post-secondary culinary educators in order to determine the actual nutritional content taught in post-secondary culinary curriculum. Results from the Delphi study and statistical analyses from both survey questionnaires (based on research objectives and research questions) formed the basis to model the relationship between nutrition and culinary curricula.

### **Significance of the Study**

The findings of this study will provide both academic and culinary industry stakeholders a foundation for better understanding how nutrition contents fit into overall post-secondary culinary curriculum design, identifying what perceived barriers and gaps exist in teaching nutritional concepts for post-secondary culinary curriculum and how well it is currently being achieved.

Educators will have the necessary information to effectively integrate nutrition competency into curriculum, thus providing current culinary and hospitality students a solid foundation in nutritional concepts in the design of menus and preparation of commercial foods. Future graduating culinary and hospitality students would be better trained to prepare commercial foods

that are both tasty and nutritious. In addition, this study will serve as a foundation for future research on how to reevaluate the design of culinary curriculum to reflect the needs of the industry and stakeholders. Finally, society would benefit from the reduction of lost work hours, the loss of tax base, and the reduced cost of medical care for obesity related illnesses. Obesity, however, is not an isolated occurrence; every member of society is affected directly or indirectly. Therefore, this research will help provide a viable solution to the growing obesity crisis which has yet to be investigated.

### **Definitions**

*American Culinary Federation Educational Foundation (ACFEF)* began its professional certification program in 1994 as the culinary industry's very first attempt to measure a cook or chef's level of competency and match those competencies to national and international culinary standards. The primary function of the ACFEF Accrediting Commission is programmatic accreditation. As a part of the accreditation process, each institution requires that curriculum, faculty, resources, support staff, and the organizational structure all substantially meet the standards set-forth by the ACFEF. These standards assure the graduates of the culinary program that the curriculum of their career choice has been approved by the ACFEF (ACF, 2007).

*The International Council on Hotel, Restaurant and Institutional Education (I-CHRIE)* is the global advocate of hospitality and tourism education for schools, colleges, and universities offering programs in hotel and restaurant management, foodservice management and culinary arts. Founded in 1946, *I-CHRIE* is the primary professional organization to which hospitality

educators belong and the body responsible for the planning, development, and implementation of the accreditation process for program in hospitality administration (I-CHRIE, 2006).

*Competency* as defined by Parry (1998) and Lowry and Flohr (2005), is composed of activities and a cluster of related knowledge, attitudes, and skills that are correlated with performance, can be measured against standards, and can be improved through educational initiatives. Lucia and Lepsinger (1999) described a competency model as a descriptive tool that identifies the knowledge, skills, abilities, and behavior needed to perform effectively in an organization.

*Hospitality Curriculum* has the main purpose to serve the industry by producing a capable and competitive workforce (Johnson, Ghiselli, Shea, & Roberts, 2010). Curriculum can be viewed more concretely when discussed as a plan for students' academic development (Stark & Lattuca, 1997).

*Food service* is defined as the serviced provision of food and beverage (meals) purchased out of the home but which may be consumed both in and out of the home (Edwards & Overstreet, 2009). The term 'food service' is applied to the part of the economy engaged in provision of meals out of the home (Rodgers, 2010).

*Obesity and overweight*, at their most basic, is ways to describe having too much body fat, according to Harvard School of Public Health. The most commonly used measure of weight status today is the body mass index, or BMI. BMI uses a simple calculation based on the ratio of someone's height and weight. Overweight is defined as a BMI between 25.0 and 29.9; and obesity, a BMI of 30 or higher. Decades of research have shown that BMI provides a good

estimate of “fatness” and correlates well with important health outcomes like heart disease, diabetes, cancer, and overall mortality.

*Nutrition*, according to World Health Organization is the intake of food, considered in relation to the body’s dietary needs. Good nutrition, an adequate and well balanced diet combined with regular physical activity, is a cornerstone of good health. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity. Merriam Webster dictionary defines Nutrition as the process of eating the right kind of food so the person can grow properly and be healthy.

### **Organization of the Study**

This dissertation is divided into five chapters and an appendix section. The first chapter has provided a brief introduction and background into the growing consumer demand for commercial foods and the complications arising from obesity. The chapter has also discussed how post-secondary culinary curriculum can play a role in the reduction of obesity. The statement of the problem, the rationale for the study, and the research questions were introduced as well.

Chapter two presents a comprehensive review of the relevant literature. Chapter three describes the research methods, including the Delphi technique, and the qualitative survey- particularly, how participants were selected, the forms of data collection, how data was analyzed, the validation strategies used to increase the validity and reliability of the study.



Chapter four is divided in two Phases: Phase 1 presents Delphi technique, and the results of the Delphi analysis. In this phase, results are described in great detail along with the themes that emerged from the use of the Delphi technique to provide a framework for content analysis.

In Phase 2, results from the quantitative survey instrument are discussed. Primarily, it determines the competency gap between actual and perceived levels of nutritional concepts and competencies being taught in post-secondary culinary curriculum.

The last chapter, Chapter five, discusses the results of the study, model development, and the implications, future research, and limitations of the study with an ending conclusion. Copies of the internal review board approval from Auburn University, the informed consent forms, interview protocols, coding data, and survey instrument are included in an appendix section.

## **CHAPTER 2. LITERATURE REVIEW**

### **Introduction**

The purpose of this chapter is to review relevant literature in order to build a foundation on previous, related research. The previous chapter in this study has established that research is limited in regard to the post-secondary nutritional concepts and culinary curriculum design. This chapter will focus on the challenges society has faced thus far in the struggle against widespread obesity and related diseases. This literature will review culinary curriculum and the role of educators in post-secondary culinary curriculum development. Finally, the literature review will focus specifically on other studies that discuss the integration of nutrition into dietetics education, medical practices, community outreach programs and government initiatives.

### **Challenges Facing the Foodservice Industry**

The foodservice industry is facing many challenges but one of the primary concerns is its role in the current health debate in the US; specifically, the rising incidence of obesity, along with the consumption of total saturated and hydrogenated fats and salt (Edwards, 2013). Today, four out of the top ten causes of American deaths are related to unhealthy diets, heart disease, cancer, stroke, and diabetes (Heron, 2007). The public pressure will continue to call upon the foodservice industry to become part of the solution instead of being a major contributor to the health crises (Heron, 2007).

As such, the foodservice industry may have an increasingly important role and contribution to play in the health status of western populations with the term “health workers in disguise” being coined (Smith, 2004). According to Powers and Hess (2003), “That is why Americans are asking you, as an industry, to step up to the plate and redouble your efforts to accommodate the nutrition needs of all Americans, particularly those of the growing number of health-conscious customers’ the foodservice industry serves every day” (p. 1136).

The current debates about the foodservice industry address both the rise in obesity and the increasing trend of dining associated with this is the type and style of eating (Edward, Engstrom, & Hartwell, 2005). One of the major challenges the foodservice industry faces is that while consumers claim they want healthier choices at restaurants, they often purchase more indulgent products when they dine commercially (Kant & Graubard, 2004). People want to consume food that is appealing and healthy, but often have to choose between the two. Health and culinary professionals should continue to work to combine taste and health into one affordable dining experience (Glanz, et al, 2007).

One study stands out in particular: the Healthy Menu study conducted by Produce for Better Health Foundation, which is a 501 (c) 3 nonprofit educational foundation seeking to increase consumption of fruits and vegetables in attempt to foster a healthier food environment. This study used structured interviews with 41 senior menu development and marketing executives at leading casual and fast food dining establishments to obtain qualitative data about current practices. The interview covered the following topics: general business issues and menu trends; factors influencing new menu items; the role of “healthier foods” in restaurant menus; restaurant experience with healthy dining options; obstacles to adding healthier options; the marketing of healthier products, and opinions about future trends.

Findings demonstrate consensus among interviewees that the most important issues are increasing sales and profits. There was also agreement that restaurants will not add items to their menus unless they are confident their customer base will accept them and will, in turn, contribute to profits. However, they do believe there is greater customer awareness regarding the importance of eating healthier and providing healthier options (Glanz, et, al, 2007). Barriers to offering healthier items include: short shelf life, low sales, high cost, and storage space requirements.

Many hospitality organizations are currently not designed to be successful in meeting the challenges they face in the future. This is partly due to the fact that foodservice is a fragmented industry comprised of thousands of individual operations, most of which are independently owned and relatively small (Michalski, 1990). This makes the act of standardizing nutritional standards difficult because of cost and a lack of centralized facilities. In addition, the industry is required to provide training to a constantly changing kitchen staff. Complicating this issue even further is that unlike some other professions such as dietetics, managers in the foodservice industry have no specific educational requirements. As a result, a lack of nutritional expertise will continue to be a challenge for the foodservice industry.

For example, a 1995 study of the largest restaurant chains found that only 20% employed a registered dietitian who could assist with the development of health-oriented menu selections (Clay, Emenheiser & Bruce, 1995). Evolving consumer needs, increased competition, technological advances, and globalization are all current patterns that will lead towards a complete redesign of tomorrow's hospitality organization (Enz, 1993). Fortunately, the foodservice industry is making progress in a number of proactive efforts.

For instance, a website HealthyDiningFinder.com was launched in 2007 in collaboration with the National Restaurant Association (NRA) and with partial funding from the Centers for Disease Control and Prevention (CDC). This online program now includes nearly 400 restaurants companies. New restaurants that joined this online forum in 2012 include: California Pizza Kitchen, Outback Steakhouse, Carrabba's Italian Grill, Bonefish Restaurants, Roy's Restaurant, Flemings Restaurant and BJ's Restaurant. These restaurants currently offer a selection of Healthy Dining approved menu choices including locally grown ingredients.

### **Consumer Demands for Nutritional Dining Options**

Consumers are most important in the solution to the obesity epidemic because they make individualized choices about food and lifestyle (Verduin, Agarwal, & Waltman, 2005). However, consumers only select healthier options in a supportive environment with accessible, affordable, and healthy choices (US Department of Health, 2000). Research shows that increased awareness in nutrition is leading to consumer demand for healthier alternatives in restaurants (Telf, 1995). In a study by Fitzpatrick, Chapman and Barr (1997), it was found that restaurant patrons are receptive to nutrition interventions in restaurants. The objective of the study was to evaluate a restaurant-based nutrition program by measuring customer satisfaction with lower-fat menu items and assessing consumer reactions to the program.

Questionnaires to assess satisfaction with menu items were administered to patrons in eight of nine restaurants that agreed to participate. Of 1,127 menu items rated for satisfaction, 205 were lower fat, 873 were regular, and 44 were of unknown classification. It was concluded that high satisfaction with lower-fat menu items suggest that customers will support restaurants providing

such choices. Dietitians can use these findings to encourage restaurateurs to include lower-fat choices on their menus, and to assure clients that their expectation of being indulged is not incompatible with these choices. However, researchers found that nutritious menu items will not be chosen if they do not appeal to the senses.

An observational study of 217 fast-food and sit-down restaurants in the Atlanta area revealed that it was not possible to choose a healthy main dish based on menu information (Saelens, Glanz, Sallis, & Frank, 2007). The nutrition expertise of chefs is a key component in convincing consumers to change their eating habits and seek out healthy restaurant items. In 2006, nonprofit policy organization Keystone Center released a report, requested by FDA, to develop recommendations on commercial foods (The Keystone Center, 2006). These reports that food establishments provide consumers with easily readable caloric information on the menus may increase consumer awareness and demand for smaller portions as well as healthier options (Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008).

A study conducted by Johnson, Raab, Champaner, and Leontos, (2002) examines chef perceptions of nutrition pre and post-completion of nutrition educational classes. The study employed descriptive analysis regarding chef perceptions of the role and importance of nutrition in their personal lives and in the restaurant industry. Respondents strongly agreed with (1) nutrition is taken into consideration when planning menu items (4.5 on a 5-point scale) and (2) consumers take nutrition into consideration when making menu choices (4.3 on a 5-point scale). Clearly, the number of customers requesting modified menu items is increasing, as well as the number of customers taking nutrition into consideration when selecting a restaurant; this has important implications for foodservice operators, chefs, and consumers (Johnson, Raab, Champaner, & Leontos, 2002).

The Dietetic Association and the International Food Information Council found that 71% of adults reduced fat in their diets from 42% (1994). However, this is part of the problem. While there is demand for healthier food options, studies demonstrate that consumers prefer taste over the benefits of healthier food. Despite the many Americans concerned about their nutritional health, few are willing to sacrifice the appeal of taste.

Research repeatedly shows that taste is the most important factor in consumer choice; “health without great taste has limited market value, but taste without health can have serious repercussions” (Powers & Hess, 2003). Consumer behavioral change is unlikely without addressing what criteria consumers consider when making decisions. Significant measures must be taken to make healthier dining options available, identifiable, and affordable to people of all races and income levels and in all types of geographic locations (Story, Kaphingst, Robinson-O’Brien, & Glanz 2008).

## **Curriculum**

Curriculum is a complete educational experience presented as a degree program (Tribe, 2001). The design of a curriculum involves decisions on what to include and exclude, as well as what extent regional, local, and institutional perspective should be integrated (Smith & Cooper 2000; Tribe 2002; Morgan 2004). Most hospitality programs are defined as lodging and foodservice management (Angelo & Vladimir, 1991). Culinary institutions create the need for suitable curriculum development in order to validate such institutions (Harrington et al., 2006). Post-secondary culinary curriculum uses competencies as building blocks to form a curriculum that reflects the needs of the industry.

Culinary education curriculum has its roots in the vocational education movement of the late nineteenth and early twentieth centuries and traditionally focuses on achieving student mastery of core technical culinary competencies (Mandabach, (1998). The first organized program for the hospitality industry was a hotel management curriculum at the first hotel school established in 1922 at Cornell University in Ithaca New York (McInosh, 1992). With the exception of a few four year programs, hospitality education prior to 1950 concentrated on skills training (Mayburry & Swanger, 2010). In the 1990s the industry continued to increase in complexity and so did the demand for knowledgeable and highly skilled managers with graduate degrees (Fletcher, 1991). Tyler (1949) is credited with one of the earliest models used in hospitality curriculum development. This is basically in the form of four key questions:

1. What educational purposes should the school seek to attain?
2. What educational experiences can be provided that are likely to attain these purposes?
3. How can these educational experiences be effectively organized?
4. How can we determine whether these purposes are being attained?

As the industry continues to evolve, program curricula have come under intense scrutiny from key stakeholders namely educators, alumni, students and industry professionals (Casado, 2003; Jafari & Ritchie, 1981). Furthermore there appears to be consensus on the need to constantly review the program curriculum, a view which would seem to support what Briggs, Stark, & Rowland-Poplowski, (2003) refer to as “continuous program planning” (p.364). Caused by the continuous growth of tourism worldwide, the industry has developed a need for educated professionals to shape the new developing curricula (Budby & Fiedel, 2001; Ernatawi, 2003). In



an effort to understand the base differences among nutrition and hospitality/culinary programs it is also important to understand their philosophical base.

### **Role of Educators and Curriculum Development**

Educators have a responsibility to their students to ensure they have the skills to be successful in their career paths. The training of future chefs are no exception to this rule; “students entering the field of culinary training have perceptions and expectations of what they should be taught to be successful and how well their culinary school is meeting their needs” (Muller, VanLeeuwen, Mandabach, & Harrington 2009). Stakeholders also beg the question, are culinary graduates ready for the task? The purpose of hospitality curriculum is to produce a capable and competitive workforce for the foodservice industry (Johnson, Ghiselli, Shea, & Roberts, 2010). According to Stitt (1996), hospitality educators are responsible for combining industry priorities with student needs in addition to stimulating significant research contribution into socially responsive study programs (p. 58).

A large number of culinary school graduates eventually leave the industry; therefore, it should be investigated if there even is a difference between student perception of culinary education, school curriculum, and industry needs (Severson, 2007). Both hospitality industry and researchers have criticized the skill of hospitality graduates since culinary curriculum does not offer a balanced education of teaching both managerial skills and exposing students to operational skills through practical work experience (Harper, Brown, & Irvine, 2005; Williams, 2005). Improved education and other changes begin in the classroom; “nutrition education is an effective way to improve nutrition knowledge and attitudes” (Kunkel, Bell, & Luccia, 2001).

A study addressing the effectiveness of culinary curricula, conducted by Muller, Vanleeuwen, Mandabach, and Harrington, (2009), compared current culinary students, graduated culinary students, and industry responses to their educational skills. The research employed a survey methodology to examine perceptions of how institutions can best prepare culinary students for success in the workplace. For current and graduated students, the study focuses on computer skills, overall learning, overall program satisfaction, language skills, teacher currency, relevant topics, and writing skills.

For four of the seven items (i.e., overall learning, overall program satisfaction, teaching relevancy, and relevant topics), 80 percent or more of both current and graduated students reported being satisfied with their program. Seven items were administered to just the industry respondents. These items included industry specific competencies such as communication skills (writing, speaking, and technology), comprehension, hiring, knowledge, productivity, quality of work, and time management. The items with the lowest percentages of industry respondents reporting being satisfied were communication skills and comprehension.

The study demonstrated that all three groups were satisfied with traditional culinary technical skills. Nevertheless, there is a persistent view that skills in communication need to be improved. The study conducted by Muller, Vanleeuwen, Mandabach, and Harrington, (2009), helps establish that culinary and hospitality programs are effectively teaching technical skills.

However, teaching competencies in the area of nutritional content have not been adequately examined in this study. To meet the needs of the rapidly changing hospitality industry, educators must continually investigate and identify the essential competencies necessary for the industry and revise the curriculum (Sisson & Adams, 2013).

## Competency in Culinary Education

Competencies are defined as an individual's quality and talents needed to perform a pre-described job effectively, and efficiently according to established organizational standards, and enable them to meet defined goals (Zopiatis, 2010). The American Culinary Federation Educational Foundation (ACF) implements certifications and surveys of student chef competencies through written test and skill verification (ACF, 2007). The ACF, due to its leadership role in the hospitality industry establishing standards for culinary education, often conducts research studies to determine if the competencies reflect the needs of the industry.

Hertzman and Ackerman (2010) conducted such a study to determine which categories and quality indicators best evaluate associate degree culinary arts programs (ADCAP). This study employed quantitative survey procedures based on Dillman's (2000) tailored design method (TDM), and surveyed a national sample of culinary educators (296) and industry chefs (1,183) in the USA. The survey asked participants to rate the importance levels of 50 potential quality indicators for ADCAP on a five-point Likert-type scale; a (1) equal to "not important" and a (5) to equal "extremely important." Questions were based on ACFEF core competencies and literature review, while the data was analyzed to determine the most important indicators and indicator categories. Findings demonstrated the five most important indicators of quality on a five-point scale:

1. Sanitation of kitchen laboratories- (4.83)
2. Industry experience of faculty- (4.65)
3. Subject experience of faculty- (4.65)
4. Required internship- (4.34)

## 5. Placement rates- (4.34)

These results provide a basis for educators, students, employers, and other stakeholders of ADCAP to evaluate ADCAP on the applicability of its accreditation standards, policies and procedures. However, this study does not investigate the importance of nutrition in the curriculum. In fact, out of the 50 indicators of quality, only 20 were used in the questionnaire; nutrition content did not make the top 20. Regardless, this study did emphasize the importance of using experiential learning opportunities such as internships and work requirements, hand-on class training, and courses taught by faculty with experience in culinary industry experience as an evaluation of program quality.

A study by Zopiatis (2010) investigated, “the Chef’s” perspective; in short, competencies required for a successful culinary career, as well as their competency in their field. A self-administered questionnaire with 27 competency items was administered to professional chefs. The findings revealed that technical competencies were considered most important, followed by leadership-management competencies. Technical competencies include knowledge of culinary flavors, knowledge of recipe, menu development, and culinary creativity, but did not specify nutritional competency as important.

Other studies have examined the relevancy of competencies for the culinary/hospitality industry. For instance, Katz (1955) extended its three-category managerial competency model and framework, which was used in many hospitality studies (p. 33). Tas (1998) developed competencies essential for hospitality manager trainees based on the perceptions of 75 hotel managers in the US (p. 41). One study, Umbreit (1992), proposed six major competency areas essential for hospitality graduates: leadership, human resource management, marketing, financial

analysis, total quality management, and communication skills (p. 71). Again, nutritional competences failed to make list for major relevancy to curriculum design.

Kay and Moncarz (2004) investigated important competencies for success at managerial level of the hospitality industry; the researched competencies had great success (p. 285). Thus far, only a handful of studies investigate nutritional competencies in the overall design of post-secondary curriculum. To meet the needs of the rapidly changing hospitality industry, educators must continually investigate and identify the essential competencies demanded by the industry and revise the curriculum to meet these needs (Sisson & Adams, 2013).

### **Nutritional Content in Culinary Curriculum**

Effective nutritional education is important for hospitality and culinary students so foodservice operations can have the support needed to offer healthier commercial options (Reichler & Dalton, 1998). A study by Emenheiser, Chen, and Tas (1999) identified current components of nutritional education, teaching methods and resources, as well as the resources or materials needed to improve nutrition instruction. This study included undergraduate hospitality and culinary programs in the US and was compared to foreign programs. The survey population comprised of the ICHRIE designees at 460 schools and 121 international locations. Results from the study showed that 59.7% (n=83) of US respondents offered at least one nutrition course, while 8.6% (n=12) did not offer a nutrition course.

From the 13 topics included in the study, respondents stated their education could be improved if additional teaching methods or resources were available. The nutritional topics most frequently addressed included recipe development and modification to improve nutritional value.

The study established that possessing professional cooking experience resulted in improved nutritional knowledge. The relationship between professional cooking experience and nutrition knowledge suggests that cooking laboratories could be conducive environments for improving the nutrition knowledge and practices of future chefs.

Currently, the American Culinary Federation Educational Foundation is the organization that establishes the standard competencies for accredited culinary and hospitality programs (ACF, 2007). Its delineation of nutrition competency describes the characteristics, functions, and food sources of the major nutrients, as well as how to maximize nutrient retention in food preparation and storage. These standards apply the principles of nutrient needs throughout the life cycle to menu planning and food preparation. There are a total of 16 competencies used to meet these standards; competencies are traditionally taught by a registered dietitian in a nutrition course. This format is practiced by the majority of accredited culinary and hospitality programs in the US. However, the full extent is unknown. Although, there are examples of culinary/hospitality programs that do expand and positively revise nutrition education.

There are two culinary institutions currently offering programs in nutritional cooking in the US. The Culinary Institute of America in Hyde Park, NY, and has published an extensive teaching text, the *Techniques of Healthy Cooking*, with an accompanying video series. Johnson & Wales University in Providence, RI offers a four-year degree in culinary nutrition. According to Barrier, from Johnson & Wales (2005), “we teach vegetarian cuisine, light and healthy desserts... Obviously, obesity is also part of it, because it’s all intertwined with nutrition, but the main focus is making food that’s fantastic for you but that really tastes really good, too” (p. 26).

Other community outreach programs offer healthy cooking community cooking courses to meet the growing demand. As one example, Las Vegas LEAN (Low-fat Eating for Americans Now) was one of 10 community campaigns funded by Project LEAN. The primary objective is to help Americans reduce their fat intake to less than 30%. The first phase of Las Vegas LEAN involves nutrition classes designed to empower chefs to use their creative skills to create low-fat menu items. The results of the chef interventions show varying shifts in knowledge, attitude, and behavior; this demonstrates a positive shift. There should be continuing efforts to educate chefs and change nutritional environments by providing low-fat choices for consumers (Palmer & Leontos, 1995).

### **Barriers to Nutrition Design**

Reports from dietetic educators identified several barriers in teaching culinary classes. Frustration with this task of teaching culinary classes, these educators were often faced with curriculum restrictions such as poor commitment, a lack of financial funding for updated labs and equipment, inadequate prerequisite knowledge on the part of the students about foods and nutritional modification (Canter, Moorachian, & Boyce, 2007). According to Emenheiser, Chen, and Tas (1999), “constraints preventing programs from offering a nutrition course included lack of student interest and limited faculty” (p. 1104). Barriers presenting challenges to offering healthier options from the perspective of the foodservice industry perspective included: short shelf life, low sales, high cost, and storage space requirements.

The act of ensuring the inclusion of nutrition in post-secondary culinary curriculum and hands-on practical experience may involve innovative, nontraditional means of incorporating

nutrition into school curriculum. However, establishing any new curriculum, particularly in a non-core area, involves identifying potential challenges such as overcrowded curriculum, lack of content knowledge by teachers, scarcity of resources, and varying degrees of administrative support (Probart, McDonnell, Achterberg, & Anger, 1997). This study examines what barriers may currently exist.

### **Dietetics and Medical Community Approach**

The dietetic and medical field has conducted extensive research on the disparity between nutrition knowledge and culinary skills. In a report from Canter, Moorachian and Boyce (2007), entitled, “The Growing Importance of food and Culinary Knowledge and skills in Dietetics,” the question was posed, “Do food and nutrition professionals have adequate competence in the food and culinary sciences to comfortably and confidently translate clinical recommendation into practical application?” (p. 4). In answering this question, this research asks another question: how are post-secondary culinary and hospitality programs addressing these issues for its student populations?

The report found that dietetic food educators are increasingly integrating core culinary competencies into basic food preparation and food science classes. These competencies include: sensory awareness, ingredient and flavor profiles, knife skills, classical preparation of stocks and sauces, health cooking methods, preparation of vegan and spa cuisine, and the exploration of ethnic foods (Canter, Moorachian, & Boyce, 2007). In short, the knowledge of food and management skills is critical for most areas of dietetic practice (Halling & Hess, 1995), as well as dietetic training for culinary and hospitality management operations.



The Nutrition Academic Awards Program spearheads innovations in nutrition education and ways to integrate it into medical school curricula and practice (Pearson, Stone, Grundy, McBride, Horn, & Tobin, 2001). Any approach that helps physicians practice preventive medicine, while teaching their patients how to do so, contributes to the national health agenda (Blackburn & Walker, 2005). On March 10-11, 2004, the Harvard Medical School Division of Nutrition hosted the symposium, “Science-Based Solutions to Obesity: What is the Role of Academia, Government, Industry, and Health care?” Speakers addressed a wide range of topics regarding varied disciplines of ongoing obesity research.

At the final panel discussion of the 2004 Postgraduate Nutrition Symposium at Harvard Medical School, a member from the audience asked, “Where do we go from here?” According to Blackburn, (2005), “we are attacking the problem on every possible front, from laboratories at major pharmaceutical firms to local community health centers (p. 209).” Interestingly enough, this group of researchers failed to discuss how foods are prepared and the role the foodservice industry has in this task.

In a study conducted by Marsico, Borja, Harrison and Loftus (1998), researchers compared the attitudes of dietetics educators and registered dietitians working towards teaching more food courses and culinary training components in undergraduate dietetics education. The groups agreed that culinary courses are important overall; the food course scores ranged from high and very high importance. Furthermore, the study discovered that students place more importance on nutritional content in their curriculum than those who teach the curriculum.

In addition, researchers found that their review of relevant literature did not yield similar research studies. These researchers merely found that several leaders in the field of nutrition and

dietetics recommended the integration of food and culinary skills into dietetics education (p. 693). Researchers suggested that further examination is needed in the relationship between undergraduate dietetics education, the importance of food courses, and culinary training components; especially since the role of dietetics professionals continues to change.

Other studies illustrate that the dietetic community understands the importance of culinary cooking skills as a part of dietetic training. One source states, “it is essential that every dietitian and nutritionist also be a reasonably good cook, and that the culinary arts be a fundamental part of their curriculum” (Sloan, 2007). In comparison, how reasonable is it to expect culinary professionals to possess a solid understanding of nutrition as a part of their curriculum?

A study by Short and Chittooran (2004) surveyed 231 directors of dietetic programs and 50 directors of coordinated undergraduate programs in dietetics. This study determined aspects of nutrition education instruction that have been addressed: the nature of courses in regard to the subject matter; curricular changes within the last 5 years; changes expected in the next 2-5 years; educator perception of trends in nutrition education; and the importance of nutritional topics. Findings from the study confirm that dedicated courses addressing nutrition education early in the undergraduate curriculum may allow for in-depth knowledge and increase opportunities for application throughout subsequent years. Therefore, if strategically implemented, including nutrition education concepts in culinary curriculum is a viable and practical approach.

### **Community Approach/Secondary Approach**

There are a number of community cooking programs that educate families about healthier meal alternatives. For instance, the Cooking with a Chef (CWC) program at Clemson University,

conducted by Dr. Marge Condrasky, has proven to be very successful. The CWC is a nutrition education program providing hands-on training for parents in preparing healthier food at home. Program evaluations indicated that participants enjoyed cooking and preparing food, as well as learning about food safety and recipe substitutions. The Cooking with a Chef program had a positive effect on food-related behaviors, suggesting that this model program can also reach low-income families (Condrasky, 2006). However, studies demonstrate that citizens still dine commercially more often than eating at home, and this trend is expected to increase.

Greaney, Hartwick, Mezgebu, Lindsay, Roover and Peterson (2007) completed a modified rapid assessment to explore the feasibility of implementing and sustaining a Healthy Choices Collaborative Intervention among middle school youth. This study reveals the difficulties associated with health-promotion activities; namely, challenges in moving from research to practice. According to the researchers, “persistent increases in the prevalence and earlier age at peak incidence of childhood obesity, along with predictions of reduced life expectancy associated with overweight status have challenged researchers and practitioners to develop effective sustainable interventions” (p. 250). These findings resulted in hiring regional coordinators to assist schools in implementation, allowing schools flexibility in implementation. However, implementing programs like this can be very difficult to actually integrate into a curriculum component, especially if school environments do not support the intervention.

The U.S. government is taking a proactive stance in ensuring that nutritional concepts are assimilated into elementary and high school education. Delores and Adams (1998) state that as we move further into the 21<sup>st</sup> century, public health and public education needs must be better integrated in order to address health education needs in America (p. 3). Specifically, teachers can

play a significant role in the effort to positively influence student dietary behavior (Kubik, Lytle, Hannan, Story, & Perry, 2002).

American studies have indicated that dietary patterns of children seem to worsen as children mature. This suggests that curricula stressing nutrition and health promotion at the elementary level potentially has a greater impact (Kennedy & Goldberg, 1995). If these strategies are employed, children will develop palates for healthier food at a younger age. As a result, it will create a lifetime of consuming healthier foods. This younger generation will eventually become tomorrow's consumers who will seek healthier commercial options.

Therefore, since research directed towards post-secondary culinary curriculum is limited, further research should be conducted in order to provide stakeholders with information that affects educators and society as a whole. Schools provide an excellent opportunity to promote health as interventions can reach a large number of children at one time, over an extended timeframe since most children remain in the educational system for ten to twelve years. The capacity to deliver messages or health promotion programs over an extended timeframe is considered essential in order for sustainable behavioral changes to occur (Lynagh & Sanson-Fisher, 1997).

### **Current Level of Nutrition Knowledge**

A study conducted by Chen, Legrand, and Sloan, (2008) results had varied results. The study examined potential differences in importance factors among hotel managers (general managers, food and beverage managers, and executive chefs), concerning consumer food choice. While the study did show that it was important to make healthy meals available, the study concluded that

hotel managers do not think personal health is most important criteria for meal choice. The study found that executive chefs believe more customers aspire towards a healthy eating style than hotel managers. It was suggested that further investigation into the demand for healthy meals is necessary. Legrand and Sloan (2008) stated “the knowledge hotel managers have in the field of nutrition and healthy living is of paramount importance in the continuing effort to persuade consumers to change their eating habits and seek out healthier food items when eating out” (p. 3).

Condrasky and Hegler (2009) performed a study in conjunction with Pennsylvania State University to determine the portioning habits of chefs. A survey was distributed to 300 chefs to obtain information about who establishes restaurant portion sizes, what factors influence these decisions, what food portion sizes are served in restaurants, and chef opinion regarding nutritional information and weight management. While 76% of chefs thought they served “regular” portions, they actually served portions two to four times larger than serving sizes recommended by the U.S. government. The study also found that while chefs do believe that the amount of food influences customer consumption and that large portions pose weight-related concerns, their attitudes varied regarding whether or not it is the customer’s responsibility to eat a reasonable amount of food when served a large portion (p. 54).

A study conducted by Stonerook, Wolf, Bartlett, and George, (1999) used surveys from a random sample of 300 long-term-care foodservice directors to determine nutrition knowledge, attitude towards nutrition, and management knowledge of long-term foodservice managers. The results showed that the overall attitude of foodservice managers toward nutrition tended to be positive, suggesting they believe nutrition is vital. If foodservice managers realize nutrition is critical, then they may transfer this attitude towards planning menus that reflect nutritious meals.

An earlier study conducted by Reichler and Dalton, (1998) sought to determine if chef nutritional knowledge, food preparation practices, and attitudes toward nutrition are consistent with preparing food that adheres to the U.S. Department of Agriculture Dietary Guidelines recommendations. The average scores of chefs and student chefs in each survey section were considerably lower, or less positive, than the possible scores. This indicates room for improvement in food science education, food preparation practices, and the attitude toward nutrition and healthier food preparation practices. Although the foodservice industry recognizes the importance of nutrition as part of chef certification, the practical food preparation and recipe-modification skills that are necessary to producing adhering to the Dietary Guidelines for Americans are not emphasized (Papadopolous, 1996).

In a study by Hamm, Schnaak, and Janas, (1995) entitled, “Nutrition Knowledge and Attitudes of Hotel and Restaurant Management Students,” questionnaires were distributed to 14 classes; 168 returned complete questionnaires (79.6%). The questionnaire contained 13 items to assess attitudes regarding the responsibility of chefs and restaurants to promote and practice nutrition responsibility. The results suggest that students do not feel optimal flavors and richness can be obtained without adding high-fat ingredients and salt. The results may also indicate controversy between the idea that nutrition is somewhat important in the foodservice industry, but that taste and flavor may be more important. The researchers concluded that further research is necessary to establish whether food-preparation classrooms are suitable sites for nutrition education in culinary programs. However, this research did support the integration of nutrition concepts into practical, hand-on learning experiences that already exist in hotel and restaurant management curriculums.

## **Government Views on the Importance of Nutrition and Effects on Society**

To support a healthy and well-nourished population, the U.S. Department of Agriculture (USDA) produces and promotes the Dietary Guidelines for Americans in cooperation with the U.S. Department of Health and Human Services (DHHS). It has been active since its 1992 inception to educate the public about dietary guidelines (Stewart, Blisard, & Jolliffe, 2006). The Centers for Disease Control and Prevention (CDC) is a branch of the U.S. DHHS that monitors obesity as a chronic disease. According to the CDC's medical frame, obesity is a "chronic disease and condition" that has reached "epidemic proportions." An alarmist tone is present throughout government documents. If the current obesity situation is not reversed, it could wipe out advancements made in medical areas such as heart disease, diabetes, and some forms of cancer (Kawan, 2009).

As the first High-Level Meeting of the UN General Assembly on non-communicable diseases in New York, September, 2011, the major topic for discussion was the persistent global increase of obesity and consensus that this is a tough challenge to face. A key message was governments have largely abdicated the responsibility for addressing obesity with the population, the private sector, and non-government organizations; yet the obesity epidemic will not be reversed without government leadership, regulation, as well as investment in program monitoring and research (Swinburn, et al., 2011).

America's losing battle against obesity has made it clear that teamwork, the combined efforts of academia, government, industry, and health care is required to stop the epidemic (Blackburn & Walker, 2005). Commercial food is increasingly consumed in the American diet. Many state and municipal governments, including New York City, have passed laws requiring chain

restaurants to provide caloric content and other nutritional information at the point of sale. In 2010, the Federal government moved to establish a uniform, national standard: foodservice establishments part of a chain of 20 or more locations under the same name will be required to disclose the number of calories in standard menu items adjacent to the name on the menu in a clear and conspicuous manner (National Research Council, 2012).

In 2001, the U.S. Surgeon's Call to Action to prevent obesity challenged health professionals, communities, and the food industry to confront portion size as a factor in weight control, provide foods in more appropriate amounts, and raise consumer awareness of appropriate sizes (US Department of Health, 2001). However, in a study conducted by Young and Nestle (2007) that examined responses from health authorities to decrease the size of menu items, they found that fast-food chains have responded little or ignored the calls to reduce the portion sizes of soda, French Fries, and hamburgers (p. 244).

A clear danger facing the fast-food industry is its moral responsibility and subsequent litigation on the grounds that fast food is addictive, contributes to obesity, diabetes, coronary heart disease, and many other medical conditions. There are several reasons why litigation against an industry may be a public health strategy. Lawsuits can lead to higher prices, decreased consumption, better educate the public about the dangers of consuming commercial products, and compel the industry to cease deceptive marketing and broadcasting misleading public statements (Daynard, 1998). To date, cases brought to court in America have been dismissed (Stern 2002; Anon 2003). However, states may also bring obesity lawsuits similar to those made against the tobacco industry that sought reimbursement for Medicaid expenses related to tobacco use (Young & Nestle, 2007).



## **Philosophical Relationship between Nutrition and Curriculum Design**

Nutrition has been linked with health by all civilizations; therefore, any discussion about the philosophy of nutrition must be part of the philosophy of health (Meyer-Abich, 2005). Food preparation is a matter of nutrition, so the philosophy of food preparation becomes part of the philosophy of nutrition. The emergent paradigm of culinary/hospitality studies does not have a coherent philosophical foundation regarding the role nutrition has in post-secondary culinary/hospitality curriculum.

The researcher for this study believes the complexity of nutritional concepts should be reflected in the current post-secondary culinary curriculum. As a result, new educational philosophies are needed. It may require a new paradigm in order for hospitality educators to address other disciplines, such as nutritional science, and to share a larger focus of the curriculum. These changes should bridge the gap between nutrition and culinary food preparation to better meet the needs of the foodservice industry and to provide necessary guidance for educators who prepare culinary/hospitality graduates for careers in the foodservice industry.

Critical approaches to weight reduction involve behavioral change related to diet and exercise. Stakeholders (namely, the food industry, government, academia, and health care providers) should work together to influence consumers to make healthy lifestyle choices (Verduin, Agarwal, & Waltman, 2005). The government's role is to establish rigorous standards for nutrition, while the public's role is to dictate, by making informed dining decisions (Ludwig & Nestle, 2008). The industry's role is to innovate, while the role of academia is to investigate

through rigorous scientific investigation of nutrition and health to minimize the negative effects of philosophical contradiction (Ludwig & Nestle, 2008).

The time is now for culinary and hospitality educators to revise how nutritional concepts are taught. Also, educators should decide to what degree current curriculum is influenced by philosophical influences, based on nutritional content in the design of curriculum to meet the needs of students and industry alike. How these nutritional concepts are integrated into post-secondary culinary curriculum will greatly affect the lives of future chefs, hospitality professionals, and society. Outcomes and influences will differ according to curriculum framework design and philosophical perspective. We are at a critical crossroad for the future and the direction we take will have long-term ramifications on post-secondary culinary curriculum quality and on the importance of nutrition.

### **Summary**

The literature reviewed in this chapter has helped define the challenges of obesity faced by the foodservice industry, consumers, community outreach programs, government initiatives, and society in general. This chapter has revealed that research in medicine, dietetics, and other academic disciplines have begun to integrate nutrition into appropriate curriculums.

Current discussions on post-secondary curricula design and the different perspectives of nutritional concepts have provided a better understanding of the effects curriculum change has on how nutritional concepts are taught. As the literature review highlights, a sound philosophical understanding of the role nutrition should have in curriculum development must be defined before any meaningful progress can be made.

## CHAPTER 3. METHODS

### Introduction

This chapter will outline the methods used to gather and analyze data and highlight previous research approaches that help establish the foundation for the current research. This section will begin with a diagram of a logical strategy for this research. Additionally, this section will include the criteria for the sampling population selection, justification for the use of the Delphi technique with coding methods to provide a framework for content analysis, and the utilization of a quantitative survey based on the Dillman (2000) approach to survey design in both phases of the research, followed by a step-by-step explanation of pertinent data gathering procedures. Finally, this chapter will conclude with a discussion on reliability, validity, and data analysis describing the current research, as well as a chapter summary.

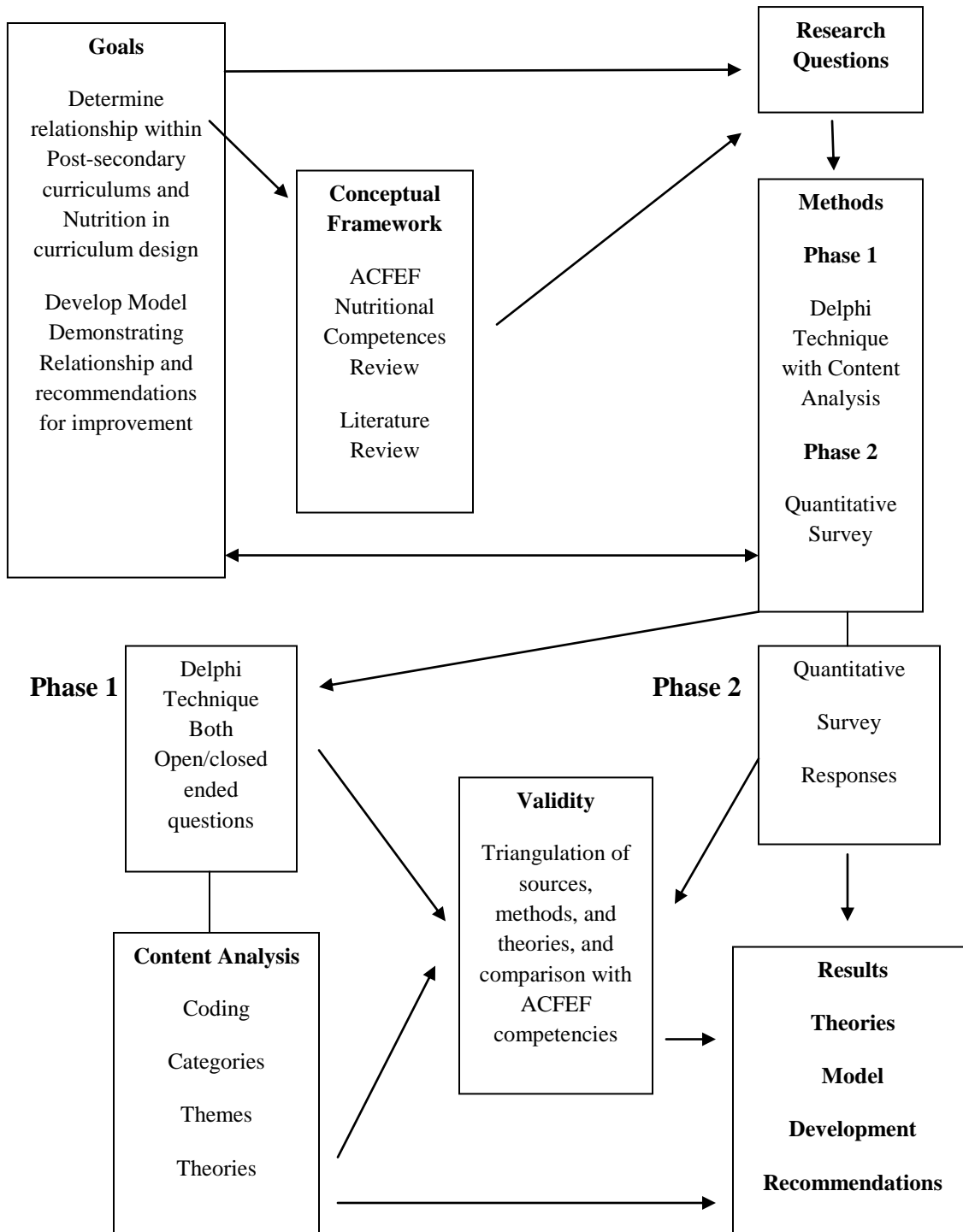
### Research Design

The purpose of a model for research design was to highlight the structure of the research in a visual format. According to Yin, (2013), “every type of empirical research has an implicit, if not explicit, research design” (p. 19); this conception of design as a model of, as well as for, research was exemplified in previous classic qualitative studies (Becker, Geer, Hughes, & Strauss, 1961), and more recently proposed by Joseph Maxwell (2012), and was used in the current research based on the following five components:

1. *Goals.* What issues do you want it to clarify?
2. *Conceptual framework.* What theories and prior research will guide this research?
3. *Research Questions.* What do you not know about the phenomena you are studying?
4. *Methods.* What approaches and techniques will you use to collect and analyze data?

5. *Validity*. Why should we believe your results?

Figure 3.1. Research Design Diagram



This study employs a mixed method research approach with interest in both narrative and numeric data to be used for analyses. There is a growing literature pointing out the advantages of research using mixed-methodologies (Brady & Loonam, 2010). Teddlie and Tashakkori (2009) point out that commonly used research process of triangulation assumes use of mixed methods, and the more distinct the methods the ‘greater opportunities for accurate inferences’ (p. 60). Tashakkori and Cresswell (2008) similarly view the use of mixed methods as a response to the need to examine ‘social phenomena in a more eclectic manner, utilizing multiple perspectives’ (p. 3). The core assumption of this form of inquiry is that the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem than either approach alone (Cresswell, 2013).

The Delphi technique is generally identified as a qualitative method and uses a group approach to gather data. Unlike focus groups, Delphi groups do not have to meet physically. Therefore, it has wider applicability as one of the major “consensus methods” for collecting qualitative data (Jones & Hunter, 1995). This research employs a traditional Delphi process modeled after Mayburry and Swanger (2010) with some minor modifications to increase the role of the panel members. In addition, this study will utilize a quantitative survey procedure, which uses Dillman (2000) tailored design method (TDM).

The Delphi study has been selected because of its ability to illicit better understanding and consensus on particular issues; namely, in this study, nutrition and its relationship to curriculum development in post-secondary culinary programs. Although the Delphi technique originated in predicting the effects of thermonuclear warfare, its use is still influential in research, particularly in research where the structure group communication process allows a group of individuals to deal with a complex problem as a whole (Linstone & Turoff, 1975).

The Delphi portion of the study provides the data to be interpreted through coding methods and is used to develop a framework for content analysis. Content analysis methodology places emphasis on the systematic collection, coding and analysis of data, and is a method for summarizing any form of content by counting various aspects of the content. In this case, Denzin and Lincoln (1994) suggest the use of the French word *bricolage* (using what comes to hand to get the job done) as an analogy for qualitative research of this type. This research uses open coding, from content analysis research methods, which involves fracturing the data i.e. breaking down the data into distinct units of meaning. Such a process allows the researcher to place specific 'phenomena' into groups giving rise to early concept development for the emerging theory (Loonam & McDonagh, 2008).

The quantitative methods portion of the study uses a survey instrument composed of 24 questions developed to measure study variables; this has been designed according to Dillman's Total Design Method. For reasons of cost and ease of implementation, email surveys were used. Email surveys have been used for social research, rather than telephone or face-to-face interviews (Dillman, 2007). This method improves response rate and reduces nonresponse error.

To lay a foundation for understanding culinary curriculum and the role nutrition plays in today's culinary curriculum, an extensive review has been conducted of not only current literature, but reviews of post-secondary culinary curriculum competencies required for chef certification set forth by ACFEF, and other relevant literature. The ACFEF is the largest professional chef organization in North America; it is made up of more than 20,000 members who belong to more than 200 chapters across the United States.

## Sampling

The sample for this study consists of two groups that represent a variety of industry professionals. In the first group for the Delphi portion of the study, the Delphi panel was composed of 38 members, to include post-secondary educators teaching ACF core competencies and culinary nutrition classes at the post-secondary level, and members from community nutritional services, in addition to industry professionals (including executive chefs, foodservice managers, and members representing the restaurant association).

The criteria used to select the Delphi panel have been given careful consideration. Participants were selected based on their experience in the food service industry and by their participation in professional organizations that have been established as culinary program support.

The second group for the quantitative survey portion is made up of two subgroups:

- 1) Representing ACFEF programs across the United States, a total of 220 post-secondary culinary program coordinators/instructors was asked to participate in the study. Each coordinator/instructor is responsible for curriculum development/instruction and serves a school accredited by ACFEF (the primary function of the ACFEF Accrediting Commission is programmatic accreditation). As a part of the accreditation process, each institution is required to demonstrate that curriculum, faculty, resources, support staff, and the organizational structure all substantially meet the standards set-forth by ACFEF. These standards assure the graduates of the culinary program that the curriculum of their career choice has been approved by ACFEF. The contact list for coordinators, names, and email addresses is a public record and provided by ACFEF.

2) Request for study participation was sent to approximately 296 members of the International Council on Hotel, Restaurant, and Institutional Education (ICHRIE), all of which direct/teach culinary or hospitality management courses. Educators affiliated with ICHRIE are hospitality and tourism educators from academic institutions offering programs in hotel and restaurant management, foodservice management, and the culinary arts. The contact list for coordinators, names, and email addresses is made available to members of ICHRIE.

### **Data Collection**

The data collected from the survey includes the following demographic information about the respondents: gender, age, professional career, years of service, and level of education. The demographic information is followed by list of ACFEF competencies that ask respondents to rate the degree of importance and frequency nutritional concepts are taught in post-secondary culinary curriculum. Additionally, there are inquiries designed to determine the nutritional relationship to post-secondary curriculum design, and what barriers exist to teaching nutritional competency in the post-secondary curriculum. These questions sought to expand the knowledge about competencies and related issues, such as views on governmental involvement and consumer influence. Moreover, the survey included questions that will determine how competent stakeholders and educators perceive post-secondary hospitality/ culinary students are in their current skills in their post-secondary curriculum education.

### **Phase 1: Outline of the Delphi Technique Data Collection**

Research began with a questionnaire created with available literature related to the research topic, post-secondary culinary curriculum, and competencies established by ACFEF addressing nutrition for the purpose of answering the research questions:



1. To what extent are nutritional concepts and competencies being taught in post-secondary culinary curriculum?
2. To what degree do stakeholders think nutritional concepts should be taught in culinary curriculum?
3. To what degree do stakeholders think knowledge of nutritional concepts positively contributes to reducing obesity in the public foodservice industry?
4. What are the perceived barriers and competency gaps of teaching nutritional concepts in post-secondary culinary curriculum identified by current stakeholders?
5. What are the philosophical relationships between nutrition and culinary curricula?

The next step was the formation of the Delphi panel of experts. The “expert” status of the respondents often guarantees the validity of the results (Green, Jones, Hughes, & Williams, 1999). Goodman (1987) states that if the participating panelists can demonstrate they are reliable representatives of their specified field, then the content validity can be assumed (p. 731).

However, the challenge of ensuring a study is sound, reliable, valid, and impartial is often faced when using participatory methods; overcoming this barrier will make the final results trustworthy and applicable to a larger population (Robson, 1998; Long & Johnson, 2000). To guarantee this, the value and importance of this challenge were conveyed to all members of the Delphi panel.

Specifically, the following procedures were followed:

- 1) Via telephone, participants were asked if they were willing to participate in the study. They were given a brief overview of the study for their clarification and understanding. This initial exchange also served as an opportunity to discuss research goals and question the study outline with the participant. This increased the role of panel members in questionnaire development and

was beneficial in promoting continued participation. This also helped avoid the dangers of non-responsiveness error and panel member attrition.

2) An invitation and consent form was emailed to participants with a description of the timeline and expectations of the study.

3) The first round of questions [which merely consisted of initial subject consideration] was sent by email, utilizing *Survey Monkey online tool* (<http://www.surveymonkey.com>). These questions contained both open and closed-ended items. Open-ended questions were designed to solicit information about the areas of concern that could present layers of understanding from Delphi panelists (Custer, Scarcella, & Steward, 1999). On the other hand, closed-ended questions allowed for specific information. Each panel member was asked to respond to the research questions.

4) The responses from Delphi I (data synthesis) were used to formulate statements for Delphi II (subject exploration) of the study. The responses were sorted qualitatively with similar themes grouped together. All responses were reviewed to avoid incomplete responses or errors caused by misinterpretations of the instructions.

5) Compiled responses from Delphi I and results were listed under the appropriate question for the Delphi II. Panelists received directions and a link to complete the questionnaire on *Survey Monkey*. The questionnaire was generated, posted, and the responses collected for preliminary analysis. Panelists rated all of received responses on the first questionnaire with a Likert-type scale of “strongly disagree, disagree, neutral, agree, and strongly agree”, or “no importance, limited importance, moderate importance, considerable importance and essential”, depending on the type of questioning. The coding of the responses is assigned with the following numbers: (1)-

strongly disagree, (2)-disagree, (3)-neutral, (4)-agree, and (5)-strongly agree, and (1)-no importance, (2)-limited importance, (3)-moderate importance, (4)-considerable importance, and (5)-essential. The web page was used to tally panelist responses, and panelist members were given the opportunity to comment after each question of the survey.

6) After receiving the results of the Delphi II, the responses of the participants for each question were recorded under the appropriate statement. After all the responses were received, the mean, and frequencies were calculated for each item for Delphi III.

7) Development of the Delphi III instrument (designed to obtain consensus and reach conclusions) was based on the responses received from the Delphi II. The mean and the frequencies of responses were highlighted for all panelists on the Delphi III instrument. For Delphi III, panelists received directions and a link to a web page, which allowed them to review all comments and rate all of the received responses of Delphi II on the same five-point Likert scale. The mean and frequencies were calculated after all of the instruments were returned; the results were further developed into the final survey instrument for phase 2 of the research.

The following processes were outlined by Pfeiffer (1968) and modeled after Mayburry and Swanger (2010):

1. The first questionnaire, which is sent to the panel of experts, may ask for a list of opinions involving experiences, judgments, predictions, and recommended activities.
2. In the second round of the Delphi survey, a copy of the collective list will be sent to each expert who will be asked to evaluate each item by some degree of importance.

3. The third questionnaire includes the list, the indicated ratings, and the consensus, if one has been reached. The experts will be asked to either revise their opinions or discuss their rationale for not coming to consensus with the group.

The closed-ended questions from the survey formed the baseline for comparison in Phase 2 of the research study. Open-ended questions are coded using principles from content analysis methodology. In this step the data is divided into meaningful analytical units and then coded; this process allows for the researcher to develop emerging concepts. This classification of concepts into specific groups is referred to as ‘conceptualizing’ the data (Strauss & Corbin, 1998). The intent of qualitative analysis is to move beyond description and to generate or discover a theory, an abstract analytical schema of a process (Strauss & Corbin, 1998).

The final survey instrument was administered to post-secondary hospitality and culinary educators in order to determine the actual nutritional content taught in post-secondary culinary curriculum. Results from the Delphi study and statistical analyses from both survey questionnaires (based on research objectives and research questions) formed the foundation for model development to illustrate the relationship between nutrition and culinary curricula.

## **Phase 2: Outline of Quantitative Survey Data Collection**

The quantitative portion of this research survey follows the principles based on Dillman’s (2000) *Mail and Internet Surveys, The Tailored Design Method*. This approach allows the researcher to follow accepted guidelines and procedures that have demonstrated success in this field of research. According to Dillman (2000), “it is the development of survey procedures that creates respondent trust and perceptions of increased rewards and reduced costs for being a

respondent, that take into account features of the survey situation, and that have as their goals the overall reduction of survey error” (p. 4).

This survey employed two formats of Likert-type scales, (1)-strongly disagree, (2)-disagree, (3)-neither agree or disagree, (4)-agree, and (5)-strongly agree, and (1)-no importance, (2)-limited importance, (3)-moderate importance, (4)-considerable importance, and (5)-essential, depending on the type of question. Questions and responses developed and used in Phase 1 Delphi panel were used as a foundation for the quantitative survey instrument. Primarily, the Delphi results were used to determine the competency gap between actual and perceived levels of nutritional concepts and competencies being taught in post-secondary culinary curriculum. The following procedures were conducted for Phase 2:

- 1) The target participants included educators from the two leading organizations ACFEF and ICHRIE. Both organizations are industry leaders that develop curriculum and establish the standards for post-secondary hospitality and culinary education in the United States.
- 2) Invitations and consent forms were emailed to participants with a description of the timeline and expectations of the study. As an incentive, each participant had the opportunity to win a fifty-dollar gift card selected randomly.
- 3) The initial invitation included directions and a web link to the survey on *Survey Monkey*.
- 4) A pilot study was conducted to measure the feasibility of methods and procedures.

Twenty-five participants were selected from the ACFEF and ICHRIE sample; the sample represented the targeted population. According to Babbie (1990), a pilot study should be directed at a representative sample of the target population; all intended questions in the pilot study should be nearly identical in the wording, format, and sequence to the final

survey instrument. However, the survey for this research required few modifications and received positive feedback from participants. Pilot participants responses are included in the main study.

- 5) Surveys were administered to approximately 220 program coordinators/instructors of post-secondary culinary and hospitality programs and approximately 296 ICHRIE members. Tables of means and relative frequencies were constructed in relation to the opinions of stakeholders (Delphi panel) and academic stakeholders.
- 6) Finally, the results from the Delphi panel were used to demonstrate an enhanced and significant perspective in understanding the philosophical relationship between nutrition and culinary curricula. The statements developed through “consensus methods” from the panel of experts’ established additional criteria that can be used for further discussion and analysis (Bogdan & Biklin, 1992).
- 7) This research developed a model illustrating the gaps between stakeholder perception of nutrition content levels and actual nutritional content levels taught in the post-secondary curriculum design. This was conducted by creating comparative models from the results of the Delphi study and ACFEF/ICHRIE survey.

The Auburn University Institutional Review Board (IRB) granted approval to begin this research study on June, 28, 2013. Phase 1, (Delphi Round 1), began on July 28, 2013 and the final round was completed on September 3, 2013. Phase 2 included the following procedures: a pilot study directed at the targeted population, which began on October 2, 2013 and concluded on October 11, 2013 and 2) the ACFEF and ICHRIE educators’ survey, which began on October 15, 2013 and concluded on December 20, 2013.

## **Reliability**

The Delphi technique, embedded with grounded theory methods, consisted of three rounds of paneling that allowed the Delphi panel to gain consensus on research questions and to allow for extended participation, which produced greater research feedback. To establish the “trustworthiness” of a study, Lincoln and Guba (1985) emphasize unique terms, such as “credibility,” “authenticity,” “transferability,” “dependability,” and “conformability,” as the naturalist’s equivalents for “internal validation,” “external validation,” “reliability,” and “objectivity” (p. 300). This was accomplished through the repetition of survey questions, written responses, and follow-up opportunities to allow further understanding and agreement on the research topic.

In research like this, repetition is essential to achieving satisfactory response rates for self-administered surveys, regardless of whether the survey was administered via e-mail, the web, or postal delivery (Heberlein & Baumgartner, 1978; Dillman, 1991). This particular study followed guidelines for the Delphi method originally proposed by Linstone and Turoff (1995), and used in Mayburry and Swanger (2010).

The quantitative portion of the research survey follows principles based on Dillman’s (2000) *Mail and Internet Surveys, The Tailored design Method*. The Tailored Design was a set of procedures designed to conduct successful, self-administered surveys that produce higher quality information, as well as higher response rates. The advantage of using this approach allows the researcher to follow accepted guidelines for survey creation that have already demonstrated success in this field of research.

However, the practice of combining survey models to achieve higher response rates has generally revealed an unsettling problem that participant answers to any particular question may vary depending on the survey model (Schwarz, Strack, Hippler, & Bishop, 1991; Dillman, Sangster, Tarnai, & Rockwood, 1996).

Cronbach's (1951) alpha statistic is used to measure internal consistency. According to Babbie (1990), an alpha of (.70) or greater indicates acceptable internal consistency. Cronbach's (1951) alpha is the most commonly used measure for reliability in social science research, which is why it was used in this study. Cronbach's alpha is used to measure the reliability of the scale so that statistics provide researchers with an average correlation for all items comprising the scale. Values typically range from 0 to 1, with higher values indicating greater reliability. For the fifteen competency domains (nutritional competencies established by the ACFEF), the alpha is between (.921) and (.956), indicating reliability, and consistency.

This research uses a mixed method approach to include the Delphi technique for Phase 1 (a method that is closely associated with qualitative methods) and Phase 2 (the quantitative educator's survey). In this way, survey questions can be worded identically in order to avoid errors that variance can cause; both phases are self-administered. Dillman (2007) notes that the use of self-administered questionnaires will become more important, both individually and as a component of mixed-mode data collections systems as we enter the twenty-first century (p. 8).

The guidelines used in this research are designed to reduce error suggested by Dillman (2000). These errors include sampling error, coverage error, measurement error, and nonresponsive error. Reducing these errors will, therefore, increase the reliability of this study. Sampling error arises when too few responses occur. In Phase 1, Delphi panel exceeded its



original member estimation of participation from (n=24) to (n=38). However, the number of Delphi members considered to be the perfect number is widely debated. Clayton (1997) suggests that a panel 15 to 30 is acceptable for a group that is similar in experience and expertise (p. 373). This number is large enough to see patterns in responses without overwhelming the researcher. Phase 2 of the study included members from two leading organizations supporting hospitality and culinary education; this also helps avoidance of sampling error.

Coverage error is another area of concern in research, which occurs when members of the survey population does not include all kinds of members of the populations; meaning, individuals who do not have an equal or known chance of being sampled for participation in the survey. The Delphi portion (Phase 1) of this study was designed to recruit “experts” in the field. Phase 1 members represent a variety of foodservice and post-secondary educational program industry leaders. Phase 2 of this research uses members from two highly respected hospitality culinary organizations in the U.S.

Measure error occurs because of poorly worded or confusing questions that prevent or interpretable answers from being obtained. This study follows the guidelines established for survey development from Dillman (2000). As such, this study has also conducted a pilot study to check for errors and poorly worded questions to avoid measure error.

Lastly, nonresponsive error results when participants who do not respond to the survey have different characteristics from those who do respond to the survey in a way relevant to the study. All individuals who were invited to participate in the Delphi portion agreed to join the study in Phase 1, while, Phase 2 produced a return rate of 26 percent (n=135). The figure that defines a high response rate is somewhat dependent on the eye of the beholder, but one trend is not:

Americans appear increasingly reluctant to respond to surveys (Groves, 1989; Steeh, 1981). Sheehan (2001) suggest that email survey response rates have been following the pattern of lower survey responses rates overall in the United States (p. 11). Possible explanations could focus on saturating the “market” people and organizations are continuously bombarded with questionnaires by researchers, academic scholars, market research, and so on (Baruch, 1999).

According to Krosnick (1999) and Dillman (1991), when respondent characteristics are representative of nonrespondents, low rates of return are not biasing. It may be that a survey that yields a very low response rate does a fairly good job of representing the population from which the sample was originally drawn, provided those who responded were quite similar to those who failed to responded (Dey, 1997). It is recommended in the case of low response rates researchers should try to indicate or discover whether the respondents are different from the nonrespondents. All of these factors have been taken into consideration in designing the research selection of this research. Moreover, demographic data of participants in this research will illustrate that nonresponsive error, due to sampling selection, has not negatively affected this research.

### **Validity**

Reliability is the ability of an instrument to measure consistently (Tavakol, Mohagheghi, & Dennick, 2008). Indications of validity lay in the extent to which data-collection instruments, or processes, measure what they are supposed to measure (Ross & Shannon, 2008). It should be noted that the reliability of an instrument is closely associated with its validity. In other words, an instrument cannot be valid unless it is reliable. However, the reliability of an instrument does not depend on its validity (Nunnally & Bernstein, 1994).

The first step of ensuring validity in this research was a careful literature review and the establishment of goals and objectives. The second step was selection of the Delphi panel. Jairath and Weinstein (1994) suggest that study participants be experts who are knowledgeable about current information and perceptions regarding the topic under investigation but are open-minded to the findings (p. 29). Delphi participants or content experts were asked to commit to the study and provide suggestions on the design of the research questions for further use in Phase 2 of the research. In Phase two of the research, professional educators from leading hospitality and culinary education institutions were used as “content experts” in gathering data for this research.

In a Delphi panel of experts, the “expert” status of the respondents often assures the validity of the results (Green, Jones, Hughes & Williams, 1999). Goodman (1987) states that if the participating panelists can be shown that they are representatives of the specified scope of knowledge, then content validity can be assumed (p. 731). However, a challenge often faced while using participatory methods is ensuring that the study is sound, reliable, valid, and impartial. In this way, the final results can be viewed as trustworthy and applicable to a larger population (Robson 1998; Long & Johnson, 2000). To ensure this, the value and importance of this study was conveyed explicitly to all members of the Delphi panel.

Through their studies, Dalkey and Helmer (1993) have documented that the Delphi Techniques statistically tend to produce not only convergence, but convergence that reflects the true value. Helmer (1993) emphasizes the clear evidence the Delphi technique demonstrates in producing validity and relatively reliable forecasts.

In regard to the current research, validity was established by use of multiple forms of triangulation and participant feedback. Triangulation or “Cross-Checking” is the gathering of

information and conclusions through the use of multiple procedures and when sources are in agreement you have “Corroboration.” This research used multiple sets of data and research methods to establish understanding and meaning to the research objectives. The use of open-ended questions in the Delphi phase of the research allowed participant feedback and discussion. This allowed researcher’s interpretations and conclusions with the actual participants and other members of the participant community for verification and insight.

Closed-ended survey questions allowed for the data to be gathered from multiple groups of participants using the Delphi technique and quantitative research survey procedures for a comparison of results to be made using correlation procedures.

### **Data Analysis**

In the Delphi process, analysis can involve qualitative and quantitative data. Research using qualitative data in Delphi studies, utilizes open-ended questions to solicit participant opinions in the initial phase of the study. Subsequent repetition identifies achievement of consensus. The open-ended questions were coded, categorized, and further developed into themes that help describe the relationship between nutrition and post-secondary curriculum using content analysis methodology. The major statistics used in the Delphi study include descriptive statistics, frequencies, means, and standard deviations to determine degrees of importance, and consensus, along with coding based on content analysis for open-ended questions. The statistical analyses following the Delphi study, which address each of the research questions, includes descriptive statistics, reliability analysis, and independent-sample t-test. Using this mix-method approach allows for triangulation of the data, “the use of multiple methods to study a single problem” (Patton, 2002, p. 247).

The Delphi study establishes the criterion variable or dependent variable that represents the level of importance of competencies and related questions regarding nutrition and post-secondary culinary curriculum in order to further understand the philosophical relationships between nutrition and culinary curricula. The variants or independent variables are made up of industry educators including program directors and instructors teaching at institutions offering associate and/or bachelor degrees in hospitality/culinary management.

### **Summary**

This chapter details the Delphi technique procedure and the quantitative analysis employed in this study. The first part of the study uses a modified Delphi technique modeled after Mayburry and Swanger (2010) embedded with content analysis methods, this part of the study collects data through rounds of questioning to establish an “expert” panel consensus. This consensus will be used to form the dependent variable (or level of importance of the competencies) in order to compare in ACFEF and ICHRIE research question responses in Phase 2 (which contains independent variables).

A review of Phase 2, which used a quantitative survey procedure, following Dillman’s (2000) tailored design method, (TDM). This method analysis included a discussion on validity and reliability into the study’s design. The procedures listed in this chapter delineate the methods and trustworthiness of this research. These processes offer results proven to be beneficial in understanding and gathering relevant information in order to develop curriculum based on a clear philosophical understanding and gathering of the nutritional relationship between culinary curricula and its degree of health-related importance.

## **CHAPTER 4. Results**

### **Introduction**

In this chapter, results were discussed in two sections, Phase 1, Delphi technique and Phase 2, quantitative survey data. In Phase 1, the chapter begins with the description and response rate of participants, followed by an analysis of the Delphi technique data, which outlines each round of the Delphi panel responses and develops a composite description of the open-ended questions of all participants. This composite includes both survey and written responses from Delphi panel members regarding their answers to the research questions.

The data from the open-ended questions was categorized to form clusters of meaning, and then further developed into textural descriptions providing significant statements and themes, using modified steps in content analysis for better understanding of the barriers in teaching nutritional competency in post-secondary culinary curriculum. In addition, statements from phase 2 were summarized for comparison in Phase 1 of the research; the final outcome resulted in recommendations to address barriers to teaching nutritional competency in post-secondary culinary curriculum.

In phase 2, the quantitative (survey responses) was discussed in phase 2 of the study by comparing the degree to which nutritional concepts and competencies were being taught in post-secondary culinary curriculum, to what Delphi Panel, or the experts, believe in regard to how nutritional concepts and competencies should be taught in post-secondary culinary curriculum. These results are compared to the ICHRIE and ACFEF educator's responses to determine results. Results allowed the researcher to determine the philosophical relationships between nutrition and

culinary curricula based on these outcomes and serve as a foundation for model development in chapter 5, illustrating how to best integrate nutritional competency into curriculum.

### **Phase 1: Delphi Technique, Content Analysis**

The research procedure consisted of utilization of a three-round Delphi technique, Phase 1, to gain consensus on the research questions to be used for comparison in Phase 2 of this research study, and gather statements for further development through content analysis methodology. The three round Delphi produced little variance in agreement. This established that expert members were in overall agreement or disagreement consistently throughout the Delphi rounds. While a strong consensus was achieved, members did share areas of concern that differed in opinion when asked to comment on the focus and development of the survey. The following are a couple of member's comments of the current research:

*... if these changes do not happen soon we will not be acting ethically, If we know anything, we know the past has taught us that if we do not change our diets, activity and daily habits that obesity and high blood pressure will shorten our life span and will bankrupt this country.*

To the following statement:

*...most of the schools I know have courses on nutrition. However it is not our responsibility to govern what people want to eat. Yes, the students need to know about it, yes we need to be able to answer questions from the public, and yes we need to be able to address the needs of our customers. It comes down to individual choice to eat healthy or not, we provide the choices not dictate them.*

Most of the members agreed:

*...post-secondary culinary students need to obtain nutritional competencies to the extent at which they can fully understand dietary principles as they relate to*

*medical nutrition therapies in order to service the public in such a way as to become a trusted source for serving food that meets the customer's nutritional need.*

The fact participants were made up of a diverse group of “expert” professionals, and serving in leadership positions of support to the commercial food service industry fostered relevant and meaningful dialog to emerge throughout the rounds of the Delphi technique data gathering. The following is a complete profile of the Delphi panel.

### **Description of Participants**

In Phase 1, the Delphi panel totaled 38. This panel includes foodservice industry professionals; specifically, executive chefs, food service managers, members of the community representing the restaurant industry, and post-secondary culinary and hospitality educators who either direct culinary programs and/or teach within programs accredited by the American Culinary Federation. Table 4.1. provides a detailed description of the Delphi panel and affiliations.

Table 4.1. Demographics of Delphi Panel (N=38)

<b>Demographic information</b>	<b>Mean</b>	<b>Percentage (%)</b>
<b>Gender:</b>	(n=38)	
<b>Male</b>	18	47.06
<b>Female</b>	20	52.63
<b>Age:</b>		
<b>25-34</b>	2	5.88
<b>35-44</b>	7	20.59
<b>45-54</b>	10	29.41
<b>55-64</b>	13	38.24



Table 4.1. (Continued)

<b>65-74</b>	7	20.59
<b>Professional Career:</b>		
<b>Academic teach/5 yrs indust exp.</b>	2	5.41
<b>Academic teaching</b>	12	32.43
<b>Chef</b>	14	37.84
<b>Foodservice advocate</b>	2	5.41
<b>Foodservice management</b>	2	5.41
<b>Industry representative</b>	7	18.92
<b>Nutri/diet/college/teaching</b>	3	8.11
<b>Dietitian/community service</b>	9	24.32
<b>Restaurant operator</b>	2	5.41
<b>Years of service:</b>		(n=38)
<b>0-5</b>	7	18.42
<b>6-10</b>	4	10.53
<b>11-15</b>	4	10.53
<b>16-20</b>	5	13.16
<b>21 + years</b>	18	47.37
<b>Level of education:</b>		
<b>Associate's degree</b>	9	24.32
<b>Bachelor's degree</b>	11	29.37
<b>Master's degree</b>	11	29.73
<b>Doctoral degree</b>	6	16.22

### Levels of Consensus using Delphi Technique

Traditionally, the Delphi technique uses a series of questions seeking controlled feedback in attempt to seek the most reliable consensus among a group of experts in a specified

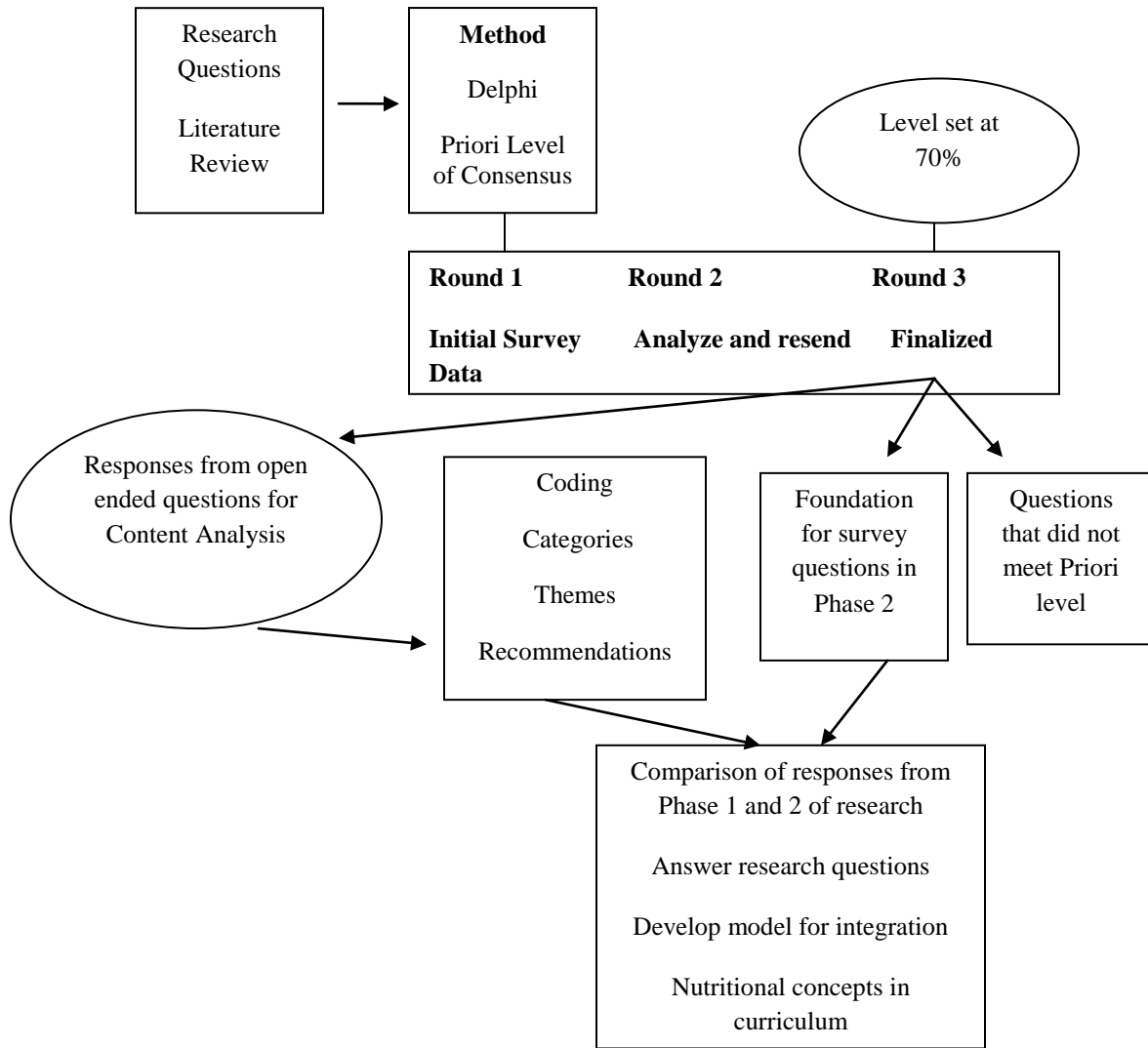
area (Linstone & Turoff, 1975). While members were considered experts, member's expertise represented different segments of the food support industry which would explain for more diverse responses to the research questions, yet the study still achieved overall consensus amongst members of the Delphi panel. Stated in Chapter 3, consensus or convergence of opinion is an underlying principle of the Delphi technique (McCallister, 1992). Weatherman and Swenson (1974) stated that there should be a convergence of opinion as individual estimations move closer to the statistical survey of the group responses (p. 94).

According to the American Heritage dictionary of the English Language, defines "consensus" as "an opinion or position reached by a group as a whole or by majority will" (American Heritage, 1994). There is no universally agreed upon percentage of agreement for consensus, generally the literature suggest that 70-80% is considered a reasonable guideline, and it is highly recommended that this level be set a priori to the data analysis (Keeney, Hasson & McKenna 2006). A priori measures of consensus were set at 70% for this study. The 70% level is set due to the diversity of the Delphi panel.

The process used in this research by the expert panel iteratively refined earlier responses as the Delphi moved through the rounds of questioning moving towards consensus statements. The statements formed from open-ended questions addressed by the study could then be subsequently tested for agreement/disagreement in the final round of the Delphi. The survey developer reviews all expert response and then modifies the tool if a pre-determined percent agreement has not been achieved. The end results served as the bases for Phase 2 survey questions.

In order to help the reader better understand the breakdown of data and varying levels of consensus the diagram in Figure 4.1. outlines the methodology.

Figure 4.1. Consensus Model Diagram



Questions 9, 14, 16 did not meet the priori level set at 70%. However, due to the nature of the questions, and how the questions related to the overall study, they are discussed to further the understanding of the relationship of nutrition in post-secondary culinary curriculum. Table 4.3. lists levels of consensus attainment and percent change between rounds of the Delphi.

Table 4.2. Delphi Levels of Consensus

Delphi	Q9	Q10	Q11	Q12	Q13
Member	<b>69%</b>	<b>91%</b>	<b>89%</b>	<b>97%</b>	<b>97 %</b>
% Consensus	<b>Consensus</b>	<b>Consensus</b>	<b>Consensus</b>	<b>Consensus</b>	<b>Consensus</b>
Average Rating Agreement					
Round One	2.68	4.36	3.96	4.48	4.63
Round Two	2.59	4.24	4.03	4.50	4.62
Round Three	2.61	4.16	3.97	4.47	4.63
Difference	0.07	0.2	0.01	0.01	0.0
Percent change	2.61	4.59	0.25	0.22	0.0
Average					
Totals	2.63	4.25	3.99	4.48	4.63

Table 4.2. (Continued)

Delphi	Q14	Q15	Q16	Q17	Q18
Member	<b>56%</b>	<b>82%</b>	<b>69%</b>	<b>87%</b>	<b>94%</b>
% Consensus	<b>Consensus</b>	<b>Consensus</b>	<b>Consensus</b>	<b>Consensus</b>	<b>Consensus</b>
Average Rating Agreement					
Round One	3.08	3.80	2.90	3.90	4.08
Round Two	3.09	3.82	2.80	3.93	4.24
Round Three	3.05	3.81	2.81	3.90	4.24
Difference	-.03	.01	-0.09	0.0	.16
Percent change	0.97	0.26	3.1	0.0	3.92
Average					
Totals	3.07	3.81	2.84	3.91	4.19

Table 4.2. (Continued)

Delphi	Q19	Q21	Q23	
Member	<b>71%</b>	<b>87% Agreement</b>	<b>90%</b>	
% Consensus	<b>Agreement</b>	<b>Y (n= %)</b>	<b>N (n= %)</b>	<b>Agreement</b>
Average Rating Agreement				
Round One	3.08	20 (80%)	5 (20%)	3.80
Round Two	3.32	29 (85%)	5 (15%)	3.79
Round Three	3.32	37 (87%)	5 (14%)	3.82
Difference	.08	6.49	-6.49	0.02
Percent change	2.47	8.11	32.45	0.53
Average				
Totals	3.24	28.66	5.00	3.80

### Ranked Level of Importance

The results section in Table 4.3. summarizes the data in terms of (1) level of importance of competency, and in Table 4.4. (2) level of needed integration of nutritional competency in post-secondary culinary curriculum. The mean scores are based on a Likert scale with data comparing the groups, Delphi panel members and educators.

From the 15 ACFEF competencies used in this research study, 7 competencies averaged 4.0 or greater in importance and level of agreement in both groups. The results show a strong correlation between Delphi panel members and educators responses correlating similarly in the rankings of importance and level of needed integration; a number of the competencies shown in Table 4.3. were rated equally important and share the same ranking.

Table 4.3. Results: Ranked Level of Importance for Each Competency Level

	Level of	Level of		
	Importance	Importance	Rank	Rank
ACFEF Competencies	Delphi	Educators	Delphi	Educators
	n=37	n=135		
Identify current USDA My Plate principle and food groups	4.03	<b>Did not meet criteria</b>	5	<b>Did not meet criteria</b>
Develop recipes and menus using dietary guidelines, recommendations, food guides, and food labels	4.21	4.20	2	4
Evaluate recipes and menus using dietary guidelines recommendations, food guides, and food labels	4.05	4.17	4	5
Discuss and demonstrate cooking techniques and storage principles for maximum retention of nutrients and effective weight management	4.24	4.33	1	2
Identify common food allergies appropriate substitutions. (i.e. gluten, sugar, lactose free)	4.21	4.36	2	1
Discuss contemporary nutritional issues. (i.e. vegetarianism, heart healthy menus and religious dietary laws).	4.03	4.23	5	3
Discuss marketing of healthy menu options	4.11	4.11	3	6

ACFEF competencies: 1.) Discuss and demonstrate cooking techniques, and 2.) Identify common food allergies both ranked 1 and 2 between groups, Delphi panel members and educators, under headings, level of importance, and needed level of integration. This suggests that agreement is evident in determining which ACFEF competencies need to be stressed and integrated into the curriculum. Interestingly, both groups ranked the same 7 competencies, above the threshold of 4.0, out of 15. Similarly, the three competencies with the lowest average rating of importance were the following: 1.) List the nutrient contribution to each food group, 2.) Discuss characteristics, functions and best sources of each of the major nutrients, and 3.)

Describe the process of human digestion. Both Delphi panel members and educators similarly rated these competencies as not as important to curriculum design. This agreement, established by this research, is important for implementation of change, and understanding of what needs to be included in post-secondary curriculum.

Table 4.4. Results: Ranked Level of Needed Integration of Nutritional Concepts

ACFEF Competencies	Degree	Degree		
	Integration	Integration	Rank	Rank
	Needed	Needed		
	Delphi	Educators	Delphi	Educators
	N=37	n-135		
Identify current USDA My Plate principle and food groups	<b>Did not meet criteria</b>	<b>Did not meet criteria</b>	<b>Did not meet criteria</b>	<b>Did not meet criteria</b>
Develop recipes and menus using dietary guidelines, recommendations, food guides, and food labels	4.34	4.06	1	4
Evaluate recipes and menus using dietary guidelines recommendations, food guides, and food labels	4.32	4.06	2	4
Discuss and demonstrate cooking techniques and storage principles for maximum retention of nutrients and effective weight management	4.24	4.31	3	2
Identify common food allergies appropriate substitutions. (i.e. gluten, sugar, lactose free)	4.32	4.33	2	1
Discuss contemporary nutritional issues. (i.e. vegetarianism, heart healthy menus and religious dietary laws).	4.18	4.14	4	3
Discuss marketing of healthy menu options	4.34	4.00	1	5

### Content Analysis Development

The second section of results from the Delphi panel consists of comments and responses from open-ended questions that focused on barriers to teaching nutritional competencies and developing a nutritional position statement to represent current post-secondary culinary

curriculum that supports the research of this study. The initial coding consisted of grouping participant responses into inductive categories; this approach limits researchers from erroneously “forcing” a preconceived result (Glaser, 1992). The inductive codes were developed by directly examining the data, with the use of enumeration and topic coding.

Data were categorized by frequency and topic association and were ranked accordingly. Categories were further broken down into subcategories for better identification and further development. Finally, recommendations were developed as a final outcome from the responses provided by survey participants using steps from content analysis methodology.

Coding in most qualitative studies is a solitary act-the “lone ethnographer” intimately at work with his data (Galman, 2007). Some experts argue that a single researcher conducting all the coding is both sufficient and preferred (Morse 1994; Morse & Richards 2002; Janesick, 2003). In contrast, other experts recommend that the coding process involve a team of researchers with differing backgrounds (Denzin 1978; Mays & Pope 1995; Patton 1999; Pope, Ziebland, & Mays, 2000) to improve the breadth and depth of the analysis and subsequent findings.

To ensure reliability, Ezzy (2013) recommends several strategies that lone researchers can benefit to assess the trustworthiness of their research: 1.) check your interpretations developed with participants themselves; 2.) initially code as you transcribe interview data; and 3.) maintain a reflective journal on the research project with copious analytic memos (pp. 67-74). The researcher took all appropriate measures to ensure reliability and trustworthiness for the following coding procedures.

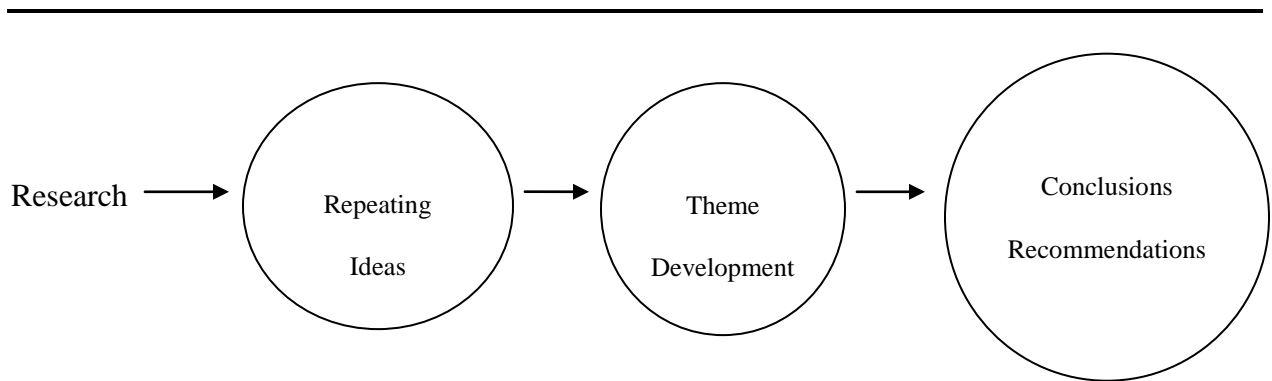
The first step of coding, interpretative process included closely reading the transcribed data, line by line and dividing the data into meaningful analytical units. Grbich, (2007) describes it as



“a process that permits data to be segregated, grouped, regrouped and relinked in order to consolidate meaning and explanation” (p. 21). Responses were grouped into categories, subcategories and then developed into themes; themes allowed for recommendations to be offered from participants responses.

When the major categories are compared with each other and consolidated in various ways, the researcher begins to transcend the “reality” of the data and progress toward the thematic, conceptual, and theoretical (Saldana, 2013). The following model (Figure 4.0.) illustrates the process:

Figure 4.0. Model Illustrating Progression of Coding Data, Themes to Conclusions and Recommendations



Statements were transcribed directly from participant’s survey input, coding (appendix 7) included combining like terms, and further divided into subcategories that represented repeating ideas. Table 4.5. provides the results from the coding process.

Table 4.5. Delphi Theme Development and Recommendations

Research Question: Please list barriers to teaching nutritional competencies in post-secondary curriculum.		
Repeating idea	Theme	Recommendations

<p>Knowledge-22</p> <ul style="list-style-type: none"> <li>• <b>Lack of nutrition knowledge of faculty</b></li> <li>• <b>Skills to teach</b></li> <li>• <b>Finding qualified instructors</b></li> <li>• <b>Past experience in healthy preparation of food service recipes</b></li> </ul> <p>Curriculum -18</p> <ul style="list-style-type: none"> <li>• <b>Not enough time in curriculum</b></li> <li>• <b>Credit hour restriction</b></li> <li>• <b>Current degree requirements</b></li> </ul>	<ul style="list-style-type: none"> <li>• Faculty/instructors lack knowledge and skills to teach nutritional competency</li> <li>• Time/credit hour does not allow for nutritional competency to be taught</li> </ul>	<ul style="list-style-type: none"> <li>• Require newly hired faculty/instructors to have the qualifications to teach nutritional competency</li> <li>• Provide continuing educational experiences for current faculty</li> <li>• Revise current curriculum to include more hour allotment to teach nutritional competencies</li> <li>• Integrated nutritional competences into current curriculum</li> </ul>
<p>Importance -16</p> <ul style="list-style-type: none"> <li>• <b>Lack of importance to students</b></li> <li>• <b>Lack of student interest</b></li> <li>• <b>Lack of motivation from participants since culinary arts is primary focus</b></li> </ul>	<ul style="list-style-type: none"> <li>• Hospitality/culinary students do not think nutritional competency is as important compared to other areas of the curriculum</li> </ul>	<ul style="list-style-type: none"> <li>• Revise philosophical position on the importance of nutritional competency in the curriculum</li> <li>• Excite faculty about the importance of nutritional competency</li> </ul>
<p>Time-11</p> <ul style="list-style-type: none"> <li>• <b>Cooking fundamentals at times does not allows us</b></li> <li>• <b>Time required for other skill/competencies</b></li> <li>• <b>Hours available in curriculum</b></li> </ul>	<ul style="list-style-type: none"> <li>• Curriculum is designed with too few credit hours/ course design without nutritional competency integrated as an integral part of the curriculum</li> </ul>	<ul style="list-style-type: none"> <li>• Revise curriculum to better meet the needs of faculty, students and stakeholders to make nutritional competency an integral part of the curriculum</li> </ul>
<p>Tradition -7</p> <ul style="list-style-type: none"> <li>• <b>Traditional French cuisine</b></li> <li>• <b>Students may be resistant if they believe that making more nutritious food will compromise taste</b></li> <li>• <b>Overcoming the concept of fine dining has to be high caloric and the word nutrition is no longer taboo</b></li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to overcome traditional cooking habits</li> </ul>	<ul style="list-style-type: none"> <li>• Train, re-train instructional faculty new skills and teaching methodologies to better meet the current needs of students</li> </ul>

<p>Influence-5</p> <ul style="list-style-type: none"> <li>• <b>Laws too influenced by government</b></li> <li>• <b>Nutrition info changes too much based on those big interest groups and not on truth</b></li> </ul>	<ul style="list-style-type: none"> <li>• Nutritional data is volatile and politically charged</li> </ul>	<ul style="list-style-type: none"> <li>• Incorporate research into curriculum using empirical studies as guides</li> <li>• Follow most current USDA guideline for most up to date information on nutrition</li> <li>• Provide ongoing continuing training for faculty and staff to keep current in nutrition</li> </ul>
<p>Ability -2</p> <ul style="list-style-type: none"> <li>• <b>Lack of financial resources</b></li> <li>• <b>Not enough teachers to facilitate education</b></li> <li>• <b>Access to information</b></li> </ul>	<ul style="list-style-type: none"> <li>• Not enough resources for nutritional concepts to be taught in current curriculum</li> </ul>	<ul style="list-style-type: none"> <li>• Revise curriculum priorities</li> <li>• Increase funding for nutritional competency</li> </ul>

The above data provides the direct statements from Delphi members (n=38), the expert panel.

For comparison the same question was presented to educators (n=135) from this group (n=102)

the following theme development and recommendations was a result of the coding process.

Table 4.6. Educator's Theme Development and Recommendations

Research Question: Please list barriers to teaching nutritional competencies in post-secondary curriculum.		
Repeating idea	Theme	Recommendations
<p>Curriculum -37</p> <ul style="list-style-type: none"> <li>• <b>Time in the courses and curriculum</b></li> <li>• <b>Limited curriculum hours</b></li> <li>• <b>Lack of integrations of nutritional instruction and opportunities for demonstrating competencies with culinary coursework</b></li> <li>• <b>Academic level of math and science required for advance nutrition courses</b></li> <li>• <b>Availability within the curriculum to add more nutrition courses</b></li> <li>• <b>Nutrition taught by a different academic unit</b></li> </ul>	<ul style="list-style-type: none"> <li>• Current curriculum design does not allow nutritional competencies to be adequately taught</li> </ul>	<ul style="list-style-type: none"> <li>• Revise current curriculum to include more hour allotment to teach nutritional competencies</li> <li>• Integrated nutritional competences into current curriculum</li> <li>• Review required prerequisite course to ensure students are adequately prepared for the required nutrition coursework</li> <li>• Establish guidelines and additional training for academic classes taught outside major area</li> </ul>

<p><b>Knowledge-35</b></p> <ul style="list-style-type: none"> <li>• <b>Lack of faculty knowledge about nutrition</b></li> <li>• <b>No experience cooking healthy</b></li> <li>• <b>Lack of appropriately credentialed instructional staff (RD, RDN)</b></li> <li>• <b>RD Instructors that have little or no knowledge of culinary techniques</b></li> </ul>	<ul style="list-style-type: none"> <li>• Faculty/instructors lack knowledge and skills to teach nutritional competency</li> </ul>	<ul style="list-style-type: none"> <li>• Require newly hired faculty/instructors to have the qualifications to teach nutritional competency</li> <li>• Provide continuing educational experiences for current faculty</li> <li>• Have chef instructors cross train with registered dietitians and vice-verse.</li> <li>• Have chef instructors and dietitians team teach curriculum</li> </ul>
<p><b>Resources-24</b></p> <ul style="list-style-type: none"> <li>• <b>Lack of resources</b></li> <li>• <b>Funding for technology</b></li> <li>• <b>Budget constraints in purchasing product for labs</b></li> <li>• <b>Lack of continuing education opportunities</b></li> <li>• <b>Lack of engaging instructional materials</b></li> <li>• <b>Lack of funding to hire educated nutrition faculty members</b></li> <li>• <b>Lab facilities</b></li> </ul>	<ul style="list-style-type: none"> <li>• Funding is not budgeted to adequately teach nutritional competency in post-secondary culinary curriculum</li> </ul>	<ul style="list-style-type: none"> <li>• Revise philosophical position on the importance of nutritional competency in the curriculum</li> <li>• Provide funding for continuing educational opportunities designed to enhance nutritional knowledge and delivery methods for faculty and staff</li> <li>• Budget funding for engaging learning materials</li> <li>• Budget for adequately design culinary labs conducive to learning nutritional competency</li> </ul>
<p><b>Time-24</b></p> <ul style="list-style-type: none"> <li>• <b>Time allowable in the current classes to be able to thoroughly teach competencies</b></li> <li>• <b>Competition for time with teaching of other culinary techniques</b></li> <li>• <b>Limited curriculum hours</b></li> </ul>	<ul style="list-style-type: none"> <li>• Curriculum is designed with too few credit hours/ course design without nutritional competency integrated as an integral part of the curriculum</li> </ul>	<ul style="list-style-type: none"> <li>• Revise philosophical position on the importance of nutritional competency in the post-secondary culinary curriculum</li> <li>• Revise curriculum to better meet the needs of faculty, students and stakeholders to make nutritional competency an integral part of the curriculum</li> </ul>
<p><b>Commitment-14</b></p> <ul style="list-style-type: none"> <li>• <b>Many chefs are not on board with healthy menu options</b></li> <li>• <b>Instructor resistance</b></li> <li>• <b>Competing academic priorities</b></li> <li>• <b>Lack of dialogue between and among</b></li> </ul>	<ul style="list-style-type: none"> <li>• Current attitudes and philosophical positions do not support nutritional competency taught in post-secondary culinary curriculum</li> </ul>	<ul style="list-style-type: none"> <li>• Revise philosophical position on the importance of nutritional competency in the post-secondary culinary curriculum</li> <li>• Provide funding for continuing educational opportunities designed to enhance nutritional knowledge and delivery</li> </ul>

<b>related fields</b>		
<b>Influence-11</b> <ul style="list-style-type: none"> <li>• <b>Government regulations</b></li> <li>• <b>Customer driven demand</b></li> <li>• <b>Industry demands</b></li> <li>• <b>What the media is covering changes daily</b></li> </ul>	<ul style="list-style-type: none"> <li>• Nutritional data is volatile and politically charged</li> </ul>	methods for faculty and staff <ul style="list-style-type: none"> <li>• Incorporate research into curriculum using empirical studies as guides</li> <li>• Follow most current USDA guideline for most up to date information on nutrition</li> <li>• Provide ongoing continuing training for faculty and staff to keep current in nutrition</li> </ul>
<b>Tradition 7</b> <ul style="list-style-type: none"> <li>• <b>Chef instructors favor classical methods of food prep</b></li> <li>• <b>Predetermined attitudes about nutrition</b></li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to overcome traditional cooking habits and teaching methodologies</li> </ul>	<ul style="list-style-type: none"> <li>• Train, re-train instructional faculty new skills and teaching methodologies to better meet the current needs of students</li> </ul>
<b>Ability-7</b> <ul style="list-style-type: none"> <li>• <b>Student Intelligence</b></li> </ul>	<ul style="list-style-type: none"> <li>• Academic level of math and science required for advance nutrition courses</li> <li>• Culinary students are very under prepared for learning nutritional science concepts</li> <li>• Not enough resources for nutritional concepts to be taught in current curriculum</li> </ul>	<ul style="list-style-type: none"> <li>• Revise curriculum priorities</li> <li>• Require higher level science prior to entering program</li> </ul>

The comments from the open-ended questions has thus far provided meaningful data that can be used to move this study closer to understanding the role nutrition has in post-secondary curriculum development and what barriers exist and how to provide stakeholders meaningful information to use in closing the gap in competency placement in regard to nutrition in post-secondary curriculum.

Between the surveyed groups, Delphi panel members, and educators, consensus about important ideas and concerns regarding barriers to teaching nutritional concepts in post-secondary culinary curriculum correlated similarly with the exception of ranking 3, to include importance and resources, and ranking 5, to include tradition and commitment. Seven

overarching themes emerged from Phase 1 and 2 of the coding process. The seven themes based on frequencies of reference include:

(1a) Faculty/instructors lack knowledge and skills to teach nutritional competency (2b) Current curriculum design does not allow nutritional competencies to be adequately taught, (3.a) (Delphi) Hospitality/culinary students do not think nutritional competency is as important compared to other areas of the curriculum, and (3.b) (Educators) Funding is not budgeted adequately to teach nutritional competency in post-secondary culinary curriculum, (d) Time/credit hour does not allow for nutritional competency to be taught, and (1.e) (Delphi) Current attitudes and philosophical positions do not support nutritional competency taught in post-secondary culinary curriculum, and (2.e) (Educators) Current attitudes and philosophical positions do not support nutritional competency taught in post-secondary culinary curriculum. Table 4.7. illustrates the frequencies and rankings from Delphi panel members and educators.

Table 4.7. Top Seven Themes by Ranking and Frequencies

Theme		Frequency/Percentage <sup>a</sup>			
Delphi		Educators		Delphi	Educators
Theme	Rank	Theme	Rank	n=29	n=102
<b>Knowledge</b>	1	<b>Curriculum</b>	1	22 (57%)	37 (27%)
<b>Curriculum</b>	2	<b>Knowledge</b>	2	18 (51%)	35 (26%)
<b>Importance</b>	3	<b>Resources</b>	3	16 (46%)	24 (18%)
<b>Time</b>	4	<b>Time</b>	4	11 (29%)	24 (17%)
<b>Tradition</b>	5	<b>Commitment</b>	5	7 (3%)	14 (10%)

<sup>a</sup>Totals do not equal 100% because respondent could choose multiple answers.

Phase 1, combined with data from Phase 2, provided data to develop statements to address barriers to teaching nutritional concepts in post-secondary curriculum. The data provided information produced the following recommendations:

**Knowledge (Ranking 1 for Delphi, 2 for Educators)**

1. Require newly hired faculty/instructors to have the qualifications required to teach nutritional competency.
2. Provide continuing educational experiences for current faculty.
3. Have chef instructors and dietitians team teach curriculum.

**Curriculum (Ranking 1 for Educators, 2 for Delphi)**

1. Revise current curriculum to include more hour allotment to teach nutritional competencies.
2. Integrate nutritional competences into current curriculum.

**Importance (Ranking 3 for Delphi members)**

1. Revise philosophical position on the importance of nutritional competency in the curriculum.
2. Excite faculty about the importance of nutritional competency.

**Resources (Ranking 3 for Educators)**

1. Revise philosophical position on the importance of nutritional competency in the curriculum.
2. Provide funding for continuing educational opportunities designed to enhance nutritional knowledge for faculty and staff.

### **Time (Rank 4 for both Delphi, and Educators)**

1. Revise curriculum to better meet the needs of faculty, students and stakeholders to make nutritional competency an integral part of the curriculum.
2. Revise philosophical position on the importance of nutritional competency in the curriculum.

### **Tradition (Rank 5 for Delphi)**

1. Train; re-train instructional faculty new skills and teaching methodologies to better meet the current needs of students.

### **Commitment (Rank 5 for Educators)**

1. Provide funding for continuing educational opportunities designed to enhance nutritional knowledge and delivery methods for faculty and staff.
2. Revise philosophical position on the importance of nutritional competency in the curriculum.

Research question five will be answered using a compilation of responses from the qualitative portion of this research in Phase 2. However, for this section of reporting results it is beneficial to relate question five to the Delphi panels responses and how these responses could affect changes in the future to curriculum design in regards to nutritional competencies.

*Research question 5, what are the philosophical relationships between nutrition and culinary curricula?* This question encompasses a broad range of issues related to nutrition and to the degree nutrition is implemented into current post-secondary culinary curriculum. Using open-ended Delphi panel member responses, the following question seeks to offer a nutritional position statement that can be developed to provide the community of



stakeholders a unified statement needed to integrate nutritional concepts into post-secondary culinary curriculum.

The position statement was asked only of the Delphi members; therefore, the reporting of the data differs slightly from the previous question related to barriers. Table 4.8. presents the results from use of grounded theory approached to composing a nutritional position statement.

Table 4.8. Theme Development and Recommendations

<b>Research question: Compose what you believe would make a nutritional position statement related to the needed level of nutritional competency in post-secondary culinary curriculum.</b>		
<b>Repeating idea</b>	<b>Theme</b>	<b>Recommendations</b>
<p><b>Students</b></p> <ul style="list-style-type: none"> <li>• <b>Students will understand the importance of sound nutrition to overall well-being of the guest/customer</b></li> <li>• <b>Effectively equipping post-secondary culinary students with the knowledge and skills necessary to create, analyze, and market healthier food.</b></li> <li>• <b>Students enrolled in post-secondary curriculums in hospitality management and culinary educations have a responsibility to be knowledgeable with regard to the dietary guideline and how to provide service and meals in keeping with these standards of practice</b></li> </ul>	<ul style="list-style-type: none"> <li>• Effectively equipping post-secondary culinary students with knowledge in regard to dietary guidelines help students to provide sound nutrition to the guest/customer</li> </ul>	<ul style="list-style-type: none"> <li>• Revise current curriculum to include more hour allotment to teach nutritional competencies</li> <li>• Integrated nutritional competences into current curriculum</li> <li>• Review required prerequisite course to ensure students are adequately prepared for the required nutrition coursework</li> </ul>
<p><b>Chefs</b></p> <ul style="list-style-type: none"> <li>• <b>Need to be well versed not experts</b></li> <li>• <b>Culinary professionals have a significant role and responsibility to fully understand dietary principles in order to</b></li> </ul>	<ul style="list-style-type: none"> <li>• Professional chefs need to fully understand dietary principles to the expected level of proficiency in order to meets the customer’s needs</li> </ul>	<ul style="list-style-type: none"> <li>• Revise philosophical position on the importance of nutritional competency in post-secondary culinary curriculum</li> <li>• Provide funding for continuing educational opportunities designed to enhance nutritional</li> </ul>

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<p><b>service the public in such a way as to become a trusted source for serving food that meets the customer's nutritional need</b></p>	<p>knowledge of nutrition for chef employee</p>
<p><b>Nutrition</b></p>	<ul style="list-style-type: none"> <li>• Require newly hired chefs to have credentials from an accreditation post-secondary culinary school demonstrating sufficient knowledge and experience in nutritional concepts</li> <li>• Revise philosophical position on the importance of nutritional competency in post-secondary culinary curriculum</li> <li>• Revise curriculum priorities</li> <li>• Follow most current USDA guidelines for most up to date information on nutrition</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Subject should hold equal or more importance</b></li> <li>• <b>Woven throughout the lecture and lab contact for all culinary arts and baking pastry</b></li> <li>• <b>Nutrition education is a rapidly growing integral part of our food choices and our culture</b></li> <li>• <b>Post-secondary curriculum and their competencies must meet this growing demand in order to be marketable to the jobs market and provide the foods necessary to keep the general public healthy</b></li> </ul>	<ul style="list-style-type: none"> <li>• Nutritional concepts should continue to be an equally important competency in post-secondary curriculum in order to provide Nutritional food to keep the general public healthy</li> </ul>
<p><b>Responsibility to Community</b></p>	<ul style="list-style-type: none"> <li>• Require newly hired chefs/cooks to have the qualifications to deliver nutritionally prepared foods</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Become trusted source for serving food that meets the customer's nutritional need.</b></li> <li>• <b>We strive to have balance of classical and basic cooking fundamentals while keeping with the nutritional needs of our consumers</b></li> </ul>	<ul style="list-style-type: none"> <li>• Strive to be a reliable provider of healthy nutritious food that taste good and benefits healthy growth</li> </ul>

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As a result of employing steps from grounded theory with use of the coding process, this research was able to generate themes and recommendations that address the needed level of nutritional competency in post-secondary culinary curriculum:

## **Theme 1-Students**

Effectively equipping post-secondary culinary students with knowledge in regard to dietary guidelines help students to provide sound nutrition to the guest/customer.

### ***Recommendations:***

1. Revise current curriculum to include more hour allotment to teach nutritional competencies
2. Integrated nutritional competences into current curriculum
3. Review required prerequisite course to ensure students are adequately prepared for the required nutrition coursework

## **Theme 2-Chefs**

Professional chefs need to fully understand dietary principles to the expected level of proficiency in order to meets the customer's needs.

### ***Recommendations:***

1. Revise philosophical position on the importance of nutritional competency in post-secondary culinary curriculum
2. Provide funding for continuing educational opportunities designed to enhance nutritional knowledge of nutrition for chef employee.
3. Require newly hired chefs to have credentials from an accreditation post-secondary culinary school demonstrating sufficient knowledge and experience in nutritional concepts

### **Theme 3-Nutrition**

Nutritional concepts should continue to be an equally important competency in post-secondary curriculum in order to provide nutritional food to keep the general public healthy.

#### ***Recommendations:***

1. Revise philosophical position on the importance of nutritional competency in post-secondary culinary curriculum
2. Revise curriculum priorities
3. Follow most current USDA guidelines for most up to date information on nutrition

### **Theme 4-Responsibility to Community**

Strive to be a reliable provider of healthy nutritious food that taste good and benefits healthy growth.

#### ***Recommendations:***

1. Require newly hired chefs/cooks to have the qualifications to deliver nutritionally prepared foods

One of the panelists provides a synopsis of a position statement:

*...with an ageing population, the high rate of obesity, and growing allergy concerns, culinary professionals have a significant role and responsibility to fully understand dietary principles in order to service the public in such a way as to become trusted source for serving food that meets the customer's nutritional need. Post-secondary curriculum and their competencies must meet this growing demand in order to be marketable to the jobs market and provide the foods necessary to keep the general public healthy.*

Another panelist worded the position statement in this manner:

*...one of the first steps to improving health is educating yourself in nutrition. For culinary students, nutrition education provides a self-improvement and the*

*relationship of nutrients to food sources. In the last few years, healthy cuisine has become a trend within the food industry relating back to the simple concepts of healthy preparation of whole foods as well as alternate food sources for allergy and diet restricted customers.*

This panelist provides a simple but more direct position statement:

*Because good nutrition is vital to health and quality of life throughout the lifespan, we are committed to nutritional education as an integral part of our culinary program.*

This section, Phase 1, concludes Delphi rounds of data reporting, and the interpretation process of the coded data, the next section, Phase 2, will take the research questions and compare expert and educator responses using quantitative statistical analysis to further develop the understanding of the relationship between nutrition and post-secondary culinary curriculum.

### **Phase 2: Quantitative Survey**

In Phase 2, the sample included 135 educators representing the ACFEF, who either direct culinary programs and/or teach within programs accredited by the American Culinary Federation and ICHRIE educators who direct/teach culinary or hospitality management courses. Table 4.9. provides a detailed description of the ACFEF and ICHRIE members and affiliations.

Table 4.9. Demographic and Professional Information of ACFEF and ICHRIE Members

	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Gender:</b>	(n=135)	
<b>Male</b>	57	42.22
<b>Female</b>	78	57.78
<b>Age:</b>		
<b>25-34</b>	6	4.48

Table 4.10. (Continued)

<b>35-44</b>	22	16.42
<b>45-54</b>	56	41.79
<b>55-64</b>	38	28.36
<b>65-74</b>	12	8.96
<b>Professional Career:</b>		
<b>Academic teaching with 5 years industry experience</b>	108	81.20
<b>Academic teaching with no industry experience</b>	18	13.53
<b>Chef</b>	5	3.76
<b>Foodservice advocate</b>	0	0
<b>Foodservice management</b>	0	0
<b>Industry representative</b>	2	1.50
<b>Nutrition/college educator</b>	0	0
<b>Dietitian/community service</b>	0	0
<b>Restaurant operator</b>	0	0
<b>Years of service:</b>		
<b>0-5</b>	19	14.07
<b>6-10</b>	23	17.04
<b>11-15</b>	27	20
<b>16-20</b>	20	14.81
<b>21 + years</b>	46	34.07
<b>Level of education:</b>		
<b>Associate's degree</b>	9	6.67
<b>Bachelor's degree</b>	13	9.63
<b>Master's degree</b>	61	45.19
<b>Doctoral degree</b>	52	38.52

In order to better understand the relationship between nutrition and post-secondary curriculum design it was necessary to determine to what degree nutritional concepts and competencies are currently being taught in post-secondary curriculum.

Research Question 1: *To what degree are nutritional concepts and competencies being taught in post-secondary culinary curriculum?*

Research question one, and the following research question in Phase 2 of this research will be answered by comparing the degree to which nutritional concepts and competencies, using a Likert type scale, are being taught in post-secondary culinary curriculum, to what Delphi panel, or the experts, believe in regard to how nutritional concepts and competencies should be taught in post-secondary culinary curriculum.

These results will be compared to the ICHRIE and ACFEF educator's responses using an independent sample t-test to determine whether experts and educators differed in their beliefs regarding the degree to which nutritional competencies are taught in post-secondary curriculum. The .05 level was chosen to determine statistical significance for this research.

Competencies used to answer research questions 1, 3, and 5 are listed in Table 4.10. The 15 competencies used in this research were developed by the ACFEF and are required to be followed by accredited culinary programs to remain in good standing with the ACFEF accrediting commission.

Table 4.10. ACFEF Nutritional Competencies

- 
1. Identify current USDA My Plate principles and food groups.
  2. List the nutrient contributions of each food group.
-

- 
3. Discuss the nine areas where dietary guidelines make recommendations.
  4. Develop recipes and menus using dietary guidelines, recommendations, food guides, and food labels.
  5. Evaluate recipes and menus using dietary guidelines recommendations, food guides, and food labels.
  6. Discuss characteristics, functions, and best sources of each of the major nutrients.
  7. Describe the process of human digestion.
  8. Determine energy needs based on basal metabolic rate and exercise expenditure.
  9. Discuss and demonstrate cooking techniques and storage principles and portion sizes for maximum retention of nutrients and effective weight management.
  10. Discuss exchange groups.
  11. Identify common food allergies and determine appropriate substitutions. (i.e. gluten, sugar, lactose free)
  12. Discuss contemporary nutritional issues (i.e. vegetarianism, heart healthy menus, and religious dietary laws).
  13. Apply emerging technologies (computerization) for nutrient analysis (i.e. Internet, recipe analysis laws).
  14. Discuss marketing of healthy menu options.
  15. Discuss weight management, exercise, and nutrition over the life cycle.
- 

### **Survey item addressing Research Question 1:**

1. To what degree are the following nutritional competencies being taught in post-secondary culinary curriculum?

Results indicate that experts ( $M= 43.22$ ,  $SD=9.298$ ) believe nutritional competencies are being taught less than educators ( $M = 50.36$ ,  $SD = 13.24$ ) believe they are teaching nutritional concepts and competencies. These findings would support the argument that post-secondary culinary graduates are not receiving the level of training needed to adequately meet the needs of



the commercial foodservice industry. Table 4.11. indicates the mean, standard deviation and independent sample t-test for Research Question 1 and survey item 1.

Tables 4.11. Results for the Degree to which Nutritional Concepts and Competencies are being taught in Post-Secondary Culinary Curriculum:

Results of Group Statistics and t-test for Equality of Means

		Mean	Std.	Std Error			
	N	Difference	Deviation	Mean	t	df	Significance
Educator	125	50.36	13.24	1.18	3.023	159	.003
Expert	36	43.22	9.29	1.55	3.659	80.130	.000

\*p<.05.

This supports the study by Hamm and Schnaak, (1995), “hotel and restaurant management students, in general, have a fairly poor knowledge of nutrition” (p. 1158). Partly, the expert panel could explain the significant differences between the two groups. The expert members are made up of a diverse group of experts, including industry chefs and restaurant managers. While educators are part of the panel, the perspectives of industry members might differ due to their firsthand knowledge of how well graduates use nutritional knowledge on the job in the preparation of menus and recipe modifications. Therefore, they may feel that nutritional concepts are not being taught at the level educators indicated.

While results showed there was a significant difference between groups, specifically experts ( $M = 43.22, SD = 9.298$ ) rated teaching competencies consistently lower than educators ( $M =$

50.36,  $SD = 13.24$ ),  $t(159) = 3.023$ ,  $p = .003$ . It is worth noting, however, that experts did rate two questions higher than educators; these questions involved listing nutrient contributions of food groups and discussing nine areas of dietary guideline recommendations.

Establishing the degree to which nutritional concepts and competencies are currently being taught allows this study to form a foundation to determine the importance both experts and educators place on nutritional content in the curriculum. Research Question 2 focuses on the value of nutritional concepts in the curriculum.

*Research Question 2: To what degree do current stakeholders think nutritional concepts should be taught in culinary curriculum?*

#### **Survey item addressing Research Question 2:**

1. To what degree do you think nutritional concepts should be included in post-secondary curriculum?

A chi-square analysis was conducted to evaluate whether there was an association in the degree to which stakeholders think nutritional concepts should be taught in culinary curriculum. Findings (Table 4.12) show that there is a highly significant relationship ( $X^2/6$ ,  $N=171$ ) = 17.915,  $p=.006$ ). As a result, 60.5 percent ( $n=38$ ) of experts felt that nutritional concepts should be incorporated throughout the curriculum, versus 32.3% of educators ( $n=135$ ). Most experts (71.1%) feel that nutritional integration is important, whereas most educators tended to have varied viewpoints. Table 4.12. indicates the chi-square analysis for Research question 2, survey item 1.

Table 4.12. Results for Extent Nutritional Concepts should be Included in Post-Secondary Curriculum

	Educator	Expert	Total
One nutrition course	33%	3%	36
Two nutrition course	13%	6%	19
Nutrition offered as an elective	3%	0	3
Nutrition is integrated into a number of courses	40%	6%	46
Nutrition course offered and integrated throughout the curriculum	43%	23%	66
No coverage of nutrition course or topic	1%	0	1
<b>Total</b>	<b>133</b>	<b>38</b>	<b>171</b>

Chi-square analysis	Value	df	Asymp. Sig (2-sided)
Pearson Chi-Squared	17.915 <sup>a</sup>	6	.006
Linear-by Linear	3.549	1	.060
N of Valid Cases	171		

**Survey item addressing Research Question 2:**

2. Culinary/hospitality educators need to take a more proactive role in educating future chef/foodservice personnel to be knowledgeable in nutritional concepts preparing students to offer healthier foods on the menus.

Experts and educators were asked, “do culinary/hospitably educators need to take a more proactive role in educating future chef/foodservice personnel to be knowledgeable in nutritional concepts that prepare students to offer healthier foods?” An independent sample t-test was

conducted to determine whether the views of educators and experts differed about educators taking a proactive role in educating future chef/food service personnel to be knowledgeable in nutritional concepts that prepare students to offer healthier foods on menus. Table 4.13. indicates the mean, standard deviation and independent sample t-test analysis for Research Question 2, survey item 2.

Table 4.13. Results for Proactive Role in Educating Future Chef/Foodservice Personnel to be Knowledgeable in Nutritional Concepts (N=171)

Results of Group Statistics and t-test for Equality of Means

		Mean	Std.	Std Error			
	N	Difference	Deviation	Mean	t	df	Significance
Educator	133	4.27	.719	.062	-2.798	169	.006
Expert	38	4.63	.633	.102	-3.003	66.736	.004

\* $p < .05$ .

Findings indicate that there is a significant difference in group means  $t(169) = -2.798, p = .006$ . Specifically, experts ( $M = 4.63, SD = .633$ ) had a significantly higher mean than educators ( $M = 4.27, SD = .719$ ). Therefore, it is demonstrated that experts place a greater importance than educators on the need for educators to take a more proactive role in becoming more knowledgeable in nutritional concepts preparing students to learn nutritional concepts. This variance continues to indicate a difference between what experts and educators believe the role educators should have in teaching nutritional concepts in post-secondary culinary curriculum.

However, when experts and educators were asked to select the level of importance of each competency statement for the knowledge area of nutrition (aka. how important is the competency to the student’s knowledge base), the results show there is no difference.

**Survey item addressing Research Question 2:**

3. Please select the choice that indicates the level of importance of each competency statement for knowledge area: nutrition (how important is the competency to the student’s knowledge base).

An independent sample t-test was performed to evaluate the level of importance experts and educators place on each competency taught in post-secondary culinary curriculum. Table 4.14. indicates the mean, standard deviation and independent sample t-test analysis for Research Question 2, survey item 3.

Table 4.14. Level of Importance for each Competency Level

Results of Group Statistics and t-test for Equality of Means

		Mean	Std.	Std Error			
	N	Difference	Deviation	Mean	t	df	Significance
Educator	125	57.84	9.332	.834	.019	159	.985
Expert	36	57.80	10.859	1.809	.017	50.821	.986

\*p<.05.

Results demonstrate that there is no difference:  $t(159) = .019, p > .05, n.s.$ ; educators ( $M = 57.8; SD = 9.33$ ), and experts ( $M = 57.8, SD = 10.86$ ) rated the importance of competencies similarly. This indicates that both experts and educators feel similar on how important competency is to the student's knowledge base. Both groups agree on the level of importance of the competency, but not on the level to which the competency should be taught in post-secondary culinary curriculum.

This could prove beneficial in determining areas of agreement in developing new strategies for teaching nutritional concepts in post-secondary culinary curriculum. Both experts and educators are also more inclined to agree that nutritional competency could affect consumer-dining behavior and as a result reduce obesity.

Research Question 3: *To what degree do stakeholders think knowledge of nutritional concepts positively contribute to reducing obesity in public foodservice?*

**Survey item addressing Research Question 3:**

1. If the integration of nutrition curriculum increases the effectiveness of nutritional competencies of post-secondary culinary students, could this affect consumer dining behavior and, hence, reduce obesity?

An independent sample t-test was conducted to determine whether experts and educators think knowledge of nutritional concepts positively contribute to reducing obesity in public foodservice. Again, there is consensus on the affect nutritional competency has on obesity, but less agreement on the degree to which the competency should be taught. From Phase 1 of the study it was evident that experts have mixed responses. One expert commented, "This is still going to be a customer choice; education will not eliminate obesity, change will." Another expert

member stated, “Personnel involved with the preparation and service of food to the public can prepare foods lower in fat, sodium, and calories which, in turn, can impact obesity.” Table 4.15. indicates the mean, standard deviation and independent sample t-test analysis for Research Question 3, survey item 1.

Table 4.15. Results of Nutritional Concepts Positively Contributing to Reducing Obesity

Results of Group Statistics and t-test for Equality of Means

	N	Mean Difference	Std. Deviation	Std Error Mean	t	df	Significance
Educator	132	3.50	1.087	.094	-1.597	168	.122
Expert	38	3.82	.896	.145	-1.777	71.416	.080

\* $p < .05$ .

Results demonstrate that there was not a significant difference between groups,  $t(168) = -1.597, p > .05, n.s.$  Both educators ( $M = 3.50, SD = 1.088$ ) and experts ( $M = 3.82, SD = .89610$ ) were more inclined to agree that nutritional competency could affect consumer dining behavior and reduce obesity.

**Survey item addressing Research Question 3:**

2. Are post-secondary culinary graduates prepared in their curriculum to meet contemporary nutritional issues facing society today?

An independent samples t-test was performed to determine whether experts and educators differed in their rating of how prepared post-secondary culinary graduates are in their curriculum to meet contemporary nutritional issues facing society today. Table 4.16. indicates the mean, standard deviation and independent sample t-test analysis for Research Question 3, survey item 2.

Table 4.16. Results How Prepared Post-Secondary Graduates are in Their Curriculum

Results of Group Statistics and t-test for Equality of Means

	N	Mean Difference	Std. Deviation	Std Error Mean	t	df	Significance
Educator	132	2.97	.940	.081	2.088	168	.038
Expert	38	2.61	.973	.157	2.048	58.356	.045

\*p<.05.

Results indicated there was a significant difference in group means,  $t(168) = 2.088, p < .038$ . Specifically, curriculum preparation in contemporary issues rated higher by educators ( $M = 2.97, SD = .941$ ) than experts ( $M = 2.61, SD = .974$ ). Therefore, educators think graduates are meeting consumer needs in modifying recipes and in the application principles. However, the experts do not think graduates are meeting consumer needs. If educators believe culinary graduates are prepared to meet nutritional issues facing society today, then this could explain why educators place less importance on nutritional competency.



**Survey item addressing Research Question 3:**

3. Should nutritional competencies be a priority when designing post-secondary culinary curriculum?

An independent sample t-test was conducted to assess differences in group means between experts and educators on the issue: should nutritional competencies be a priority when designing post-secondary culinary curriculum. Table 4.17. indicates the mean, standard deviation and independent sample t-test analysis for Research Question 3, survey item 3.

Table 4.17. Results for Nutritional Competencies as a Priority

Results of Group Statistics and t-test for Equality of Means

		Mean	Std.	Std Error			
	N	Difference	Deviation	Mean	t	df	Significance
Educator	132	3.76	.917	.079	-2.821	168	.005
Expert	38	4.24	.942	.152	-2.779	58.700	.007

\*p<.05.

Results indicated that the difference was highly significant:  $t(168) = -2.821, p < .01$ . Experts ( $M = 4.24, SD .943$ ) rated nutritional competency priority significantly higher than educators ( $M = 3.76, SD = .917$ ). These results indicate that the difference is highly significant. Experts feel that nutritional competencies should be a priority when designing post-secondary culinary curriculum, while educators place lower importance on nutritional priority than experts.

One expert response to the priority of nutritional competency is “critical that nutritional competencies are included with increased emphasis in health in the U.S.” Consistently, educators rate lower on the degree of importance for nutritional competency in curriculum design, but do feel that nutrition competency is important to the student knowledge base. The act of ensuring the inclusion of nutrition in post-secondary culinary curriculum and hands-on practical experience requires a better understanding of the barriers to doing just that. Particularly, those barriers that include an overcrowded curriculum, inadequate content knowledge of the instructor, scarcity of resources, and varying degrees of administrative support (Probart, McDonnell, Achterbert & Anger, 1997). Research Question 4 examines what barriers currently exist.

Research Question 4: *Are there barriers to teaching nutritional concepts in post-secondary culinary curriculum as identified by relevant stakeholders?*

**Survey question in support of Research Question 4:**

1. Do a number of barriers exist that prohibits teaching nutritional competencies in post-secondary curriculum?

An independent sample t-test was performed to find out if there were differences in between expert and educator views about the presence of barriers to teaching nutritional concepts in post-secondary culinary curriculum, as identified by relevant stakeholders. Findings demonstrate that there is not a statistically significant difference:  $t(166) = -.002, p > .05, n.s;$  between experts (M=3.32, SD=.93304), and educator (M=3.32, SD=1.049).

Therefore, there is a similar consensus to the degree that barriers exist. Responses to the following research question identify barriers that do exist in teaching nutritional concepts

throughout post-secondary culinary curriculum. This agreement can prove to be a positive step in the right direction and form common ground to find solutions.

Table 4.18. indicates the mean, standard deviation and independent sample t-test analysis for Research question 4, survey item 1.

Table 4.18. Results for Barriers in Teaching Post-Secondary Culinary Curriculum

Results of Group Statistics and t-test for Equality of Means

	N	Mean Difference	Std. Deviation	Std Error Mean	t	df	Significance
Educator	130	3.32	1.049	.92	-.002	166	.998
Expert	38	3.32	.933	.151	-.002	66.804	.998

\*p<.05.

Experts and educators were asked to list three barriers to teaching nutritional competencies in post-secondary curriculum in order of being most problematic.

**Survey question in support of Research Question 4:**

2. Please list three possible barriers to teaching nutritional competencies in post-secondary curriculum in the order of being most problematic.

The responses from the Delphi panel are 29, and 102 from educators. Below is a sample of the responses to Research Question 4. The complete listing of responses is provided in Appendix 7.

Responses were coded and fully developed in phase 1, Delphi techniques procedure and will be further discussed in Chapter 5 of this research study. Table 4.19. presents a sampling of responses from experts and educators, complete listing in appendix 7 and 8.

Table 4.19. ACFEF and ICHRIE Educator’s Response Regarding Possible Barriers to Teaching

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Nutritional Competencies in Culinary Curriculum

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1. *In two year program emphasis is on basic technique, understanding of methods, products, procurement, and industry in general. Short period of time in associates degree to dedicate to every topic and met all goals, objectives, and outcomes.*
  2. *Instructors not living a healthy life style themselves. Lack of knowledge of the topic. Nutrition could be considered difficult to understand which makes it even more challenging to teach.*
  3. *The mind set of educators and accrediting body, time constraints, lack of integration into main stream text books.*
  4. *The current curriculum does not integrate nutrition throughout the coursework. Nutrition is handled as a single course and those concepts are not then utilized in other work. Additionally, many of the lab courses are taught by chefs that have no nutritional training as well.*
- 

Educators were asked, “Are culinary/hospitality educators trained adequately in concepts related to the rising obesity and health problems facing society today?”, while experts were asked, “Do culinary/hospitality educators need to be trained adequately in nutritionally related concepts related to the rising obesity and health problems facing society today?” An independent sample t-test was performed to assess whether expert and educator opinions differ in regard to adequate training in nutritional concepts related to current rising obesity and health problems.

**Survey item addressing Research Question 4:**

3. Do culinary/hospitality educators need to be trained adequately in nutritional concepts related to the current rising obesity and health problems?

Results showed highly significant differences in group means:  $t(169) = -10.28, p < .001$ . Experts ( $M = 4.47, SD = .762$ ) rated nutritional training adequacy significantly higher than educators ( $M = 2.72, SD = .962$ ). Therefore, experts believe educator training significantly high while educators feel they do not have adequacy in training. Table 4.20. indicates the mean, standard deviation and independent sample t-test analysis for Research question 4, survey item 3.

Table 4.20. ACFEF and ICHRIE Educator’s Response Adequacy in Training

Results of Group Statistics and t-test for Equality of Means

		Mean	Std.	Std Error			
	N	Difference	Deviation	Mean	t	df	Significance
Educator	133	2.72	.962	.083	-10.28	169	.000
Expert	38	4.47	.761	.123	-11.69	74.114	.000

\* $p < .05$ .

In short, experts rate overwhelmingly higher than educators do in regard to the argument that educators need training to teach nutritional concepts, while educators rate lower in being adequately trained to teach nutritional concepts. Thus far the responses provide a solid foundation for the need to integrate nutritional competencies into mainstream post-secondary culinary curriculum.

This research has revealed a number of findings that provide a better understanding of the importance of nutrition in curriculum design and identifies possible barriers faced in curriculum design. These findings have also shown a significant difference in opinions between experts and educators. To better understand the significance of this study, a number of survey questions surrounding the focus of this study will be reviewed and concluded with the overarching research question of this study with Research Question 5.

Research question 5, what are the philosophical relationships between nutrition and culinary curricula? This question encompasses a broad range of issues related to nutrition and to the degree nutrition is implemented into current post-secondary culinary curriculum. Using open-ended Delphi panel member responses from Phase 1, and quantitative reporting of results in this section, seeks to offer a nutritional position statement that can be developed to provide the community of stakeholders a unified statement needed to integrate nutritional concepts into post-secondary culinary curriculum. Findings from the following quantitative survey questions combined with open-ended Delphi responses will be discussed and utilized in development of a model illustrating how nutritional concepts can be intergraded in post-secondary culinary curriculum successfully.

Research Question 5: *What are the philosophical relationships between nutrition and culinary curricula?*

**Survey item addressing Research Question 5:**

1. Should the foodservice industry have a proactive role in fighting rising obesity and health related problems facing society today?

Both panels were asked, “Should the foodservice industry have a proactive role in fighting the rising obesity and health related problems facing society today.” An independent sample t-test was performed to assess whether expert and educator opinion differs on whether the foodservice industry should have a proactive role in fighting current rising obesity and health related problems. Findings demonstrate,  $t(169) = -1.047, p > .05, n.s.$  Therefore, there is not a significant difference in that both experts ( $M = 4.16, SD = .886$ ) and educators ( $M = 3.97, SD = .99$ ) agree that the foodservice industry should have a proactive role in fighting obesity and related health problem facing society today. Table 4.21. indicates the mean, standard deviation and independent sample t-test analysis for Research Question 5, survey item 1.

Table 4.21. Results for Foodservice Industry’s Role in Fighting Rising Obesity

Results of Group Statistics and t-test for Equality of Means

		Mean	Std.	Std Error			
	N	Difference	Deviation	Mean	t	df	Significance
Educator	133	3.97	.999	.086	-1.047	169	.297
Expert	38	4.16	.886	.143	-1.120	66.335	.267

\* $p < .05$ .

Agreement was also reached when asked, “Are Consumers today seeking healthier food selection when dining out?” Both experts and educators believe that consumers today are seeking healthier food selection when dining out.

**Survey item addressing Research Question 5:**

2. Are consumers today seeking healthier food selections when dining out?

An independent sample t-test was performed to assess whether educator and expert opinions differ in whether consumers are seeking healthier food selections when dining out. Findings demonstrated:  $t(168) = -.807, p > .05, n.s.$ ; therefore, there is not a significant difference in both experts ( $M = 3.97; SD = .822$ ) and educators ( $M = 3.86; SD = .783$ ) opinions about current consumers seeking healthier food selections when dining out. Table 4.22. indicates the mean, standard deviation and independent sample t-test analysis for Research question 5, survey item 2.

Table 4.22. Results for Consumers Seeking Healthier Food Selections

Results of Group Statistics and t-test for Equality of Means

		Mean	Std.	Std Error			
	N	Difference	Deviation	Mean	t	df	Significance
Educator	132	3.86	.782	.068	-.807	168	.421
Expert	38	3.97	.821	.133	-.786	57.751	.435

\* $p < .05$ .

When asked, “Should government policies encourage the foodservice industry to offer healthier foods on the menus?” Both experts and educators responded with similar views on this issue from, “I think the general population responds very negatively to governmental intervention” to “Believe it is best for government to stay out of it, but it won’t. Practitioners MUST get involved early and stay involved in the process.”



**Survey item addressing Research Question 5:**

3. Should government policies encourage the foodservice industry to offer healthier foods on the menu?

An independent sample t-test was performed to assess whether educator and expert views differed in regard to whether government policies should encourage the foodservice industry to offer healthier foods on menus. Findings demonstrated:  $t(168) = -.091, p > .05, n.s$ ; therefore, there is not a significant difference. Both experts ( $M = 3.05, SD = .1.41$ ) and educators ( $M = 3.03, SD = 1.31$ ) felt similarly on the role government should have in encouraging healthier food choices. Table 4.23. indicates the mean, standard deviation and independent sample t-test analysis for Research question 5, survey item 3.

Table 4.23. Results for Government’s Role in Policy Making

Results of Group Statistics and t-test for Equality of Means

		Mean	Std.	Std Error			
	N	Difference	Deviation	Mean	t	df	Significance
Educator	132	3.03	1.313	.114	-.091	168	.928
Expert	38	3.05	1.413	.229	-.087	56.689	.931

\*p<.05.

Lastly, the final survey question inquires, “To what degree should nutritional competencies be integrated into (throughout) post-secondary culinary curriculum?” The finding contradicts the earlier finding where data demonstrating the degree to which stakeholders think nutritional

concepts should be taught in culinary curriculum had a highly significant relationship, ( $X^2/6, N + 171 = 17.915, p = .006$ ). The findings showed (60.5%) of experts felt that nutritional concepts should be incorporated throughout the curriculum, versus (32.3%) of educators. Most experts (71.1%) feel that nutritional integration is important, while educators tend to have more varied viewpoints. This is further evidence of an unclear philosophical position in identifying the relationship between nutrition and post-secondary curriculum design.

**Survey item addressing Research Question 5:**

4. To what degree should the following nutritional competencies be integrated into [throughout] post-secondary culinary curriculum? [Beyond nutrition courses that most accredited post-secondary culinary programs are required to offer].

An independent sample t-test was performed to assess educator and expert views on what degree nutritional competencies should be integrated throughout post-secondary culinary curriculum. Table 4.24. indicates the mean, standard deviation and independent sample t-test analysis for Research Question 5, survey item 5.

Table 4.24. Results for Degree Nutritional Competencies Integrated into Curriculum

Results of Group Statistics and t-test for Equality of Means

		Mean	Std.	Std Error			
	N	Difference	Deviation	Mean	t	df	Significance
Educator	121	55.64	11.254	1.023	-1.299	155	.196
Expert	36	58.41	11.174	1.862	-1.304	57.777	.197

\* $p < .05$ .

Findings regarding the differences in total integration of competency scores between educators and expert were not significant:  $t(155) = -1.299, p > .05, n.s.$  Educators ( $M = 55.6, SD = 11.25$ ) and experts ( $M = 58.4; SD = 11.17$ ) both similarly agreed about the degree to which nutritional competencies should be integrated throughout post-secondary culinary curriculum.

### **Summary**

This chapter discussed the results of the statistical analysis of data collected from responses to the research questions from the Delphi panel and the educator's survey. Chapter Five concludes with the summary, model development, final discussion and implications of the study.

## **CHAPTER 5. DISCUSSION AND IMPLICATIONS**

### **Introduction**

This chapter summarizes the study and discusses findings related to nutrition and its relationship to post-secondary culinary curriculum. The conclusions from this research presented in this chapter will generate a better understanding of nutrition and its role in the design of post-secondary culinary curriculum. In addition, this section will revisit the research-based recommendations deemed necessary by this study on how to integrate nutrition into curriculum. The central purpose of this chapter is to provide an illustration of how post-secondary culinary curriculum can be adjusted to better accommodate modern needs of post-secondary hospitality/culinary curriculum practitioners. The chapter will conclude with a discussion of limitations and recommendations for future research.

### **Summary of Findings**

The findings of this study reveal a gap in the degree of importance between the beliefs of experts and educators in regard to the placement of nutritional concepts in post-secondary culinary curriculum. The literature review addresses a number of areas where the integration of nutritional concepts in dietetics, as well as medical and community outreach initiatives, have proven successful. However, the literature also reveals an absence of research that directly addresses the relationship between nutrition and post-secondary curriculum design. The societal complications associated with obesity and related health issues have been widely documented and are a concern for all citizens, which includes consumers, foodservice industry personnel, government officials, and the academic community. The literature of this study delineates how

these concerns directly relate to the increasing common trend of Americans dining out of the home. To complete this research successfully and produce meaningful findings, this research 1) identifies the issue and the relevant stakeholders, 2) determines how and to what degree post-secondary culinary curriculum is currently being taught and to what degree, and 3) determines how relevant stakeholders view nutrition and the current curriculum design. The five research questions this study uses to explore these concerns are:

- 1) To what extent are nutritional concepts and competencies being taught in post-secondary culinary curriculum?
- 2) To what degree do current stakeholders think nutritional concepts should be taught in culinary curriculum?
- 3) To what degree do stakeholders think knowledge of nutritional concepts positively contribute to reducing obesity in the public foodservice industry?
- 4) What are the perceived barriers and gaps of teaching nutritional concepts in post-secondary culinary curriculum identified by current stakeholders?
- 5) The overarching research question guiding this study is: what is the philosophical relationship between nutrition and culinary curricula?

Phase 1 of the research was conducted by using the Delphi technique and successive rounds of survey responses, which formed the basis for Phase 2 of the study. Results from open-ended questions of the Delphi panel provided data for recommendations and a better understanding of the relationship between nutrition and post-secondary culinary curriculum. Phase 1 (the Delphi panel) established the criterion variable (the dependent variable) representing the level of importance of nutritional competencies and related questions regarding nutrition and post-secondary culinary curriculum to further understand the philosophical

relationships between nutrition and culinary curricula. The variants (the independent variables) were based on the educator's response using a Likert scaling instrument and included program directors and instructors teaching at institutions offering an associate's and/or bachelor's degrees in hospitality/culinary management. The .05 level was chosen to determine statistical significance.

### **Discussion and Development of a Model**

This research is not designed as a singular study, but rather is a beginning of the discussion on the importance of the philosophical relationship between nutrition and curricula design in order for foundations of culinary curricula to be better developed to meet modern commercial foodservice demands. This study's conceptual model development is based on a study conducted by Chen and Grove (1999), which addresses the importance of examining the philosophical relationship between tourism and hospitality curricula. In relation to this research, the objectives is to determine the philosophical relationship between nutrition and culinary/hospitality curriculum. In order to understand the foundational differences among nutrition and culinary/hospitality academic programs, it is necessary to understand their philosophical bases (Chen & Groves, 1999).

To better understand this relationship it is necessary to determine to what degree nutritional concepts and competencies are being taught in post-secondary curriculum. Therefore, Research Question 1: To what degree are nutritional concepts and competencies being taught in postsecondary curriculum?

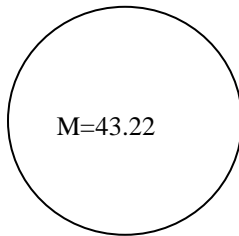
In answer to this question, research results show there is a significant difference between groups,  $t(159) = 3.023, p = .003$ . Specifically, experts ( $M = 43.22, SD = 9.298$ ) rated teaching competencies consistently lower than educators ( $M = 50.36, SD = 13.24$ ). Figure 5.1. represents the different levels of nutritional concepts and competencies taught in post-secondary curriculum. In short, experts believe nutritional concepts are being taught less than that of educators. This data is significant in establishing the gap in teaching nutritional competency in the curriculum.

Figure 5.1.

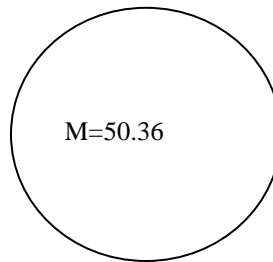
Nutrition and Hospitality/Culinary Model 1: Level of Nutrition Being Taught

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Experts



Educators



The literature review presented in this study examines a number of prior studies seeking to determine which competencies are considered important in post-secondary culinary/hospitality curriculum design. However, not one of the reviewed studies identifies nutrition as an important indicator of quality, or even essential to a successful culinary/hospitality career, or as important to their competency in their field. According to Stutts (1995), hospitality educators are responsible for combining industry priorities with student needs, as well as stimulating research contributions into socially responsive study programs (p. 54).

This research argues that a solid foundation in nutritional concepts is important to post-secondary culinary/hospitality curriculum. It also argues that changes must be made in post-secondary culinary/hospitality curriculum design to reflect modern needs stemming from existing diet and health complications rampant in society. As previously established, research indicates that the majority of food personnel possess inadequate knowledge about nutritional content. The Institute of Medicine has identified several barriers to offering healthier options in the foodservice industry; particularly in chef training. Specifically, the Institute of Medicine considered insufficient background, inadequate training in nutrition and recipe modification to be common barriers (Food and Nutrition Board, Institute of Medicine, 1991).

Figure 5.2., Model 2 illustrates previous areas of study identifying significant factors in culinary/hospitality curriculum. This model is based on the relationships that exist between nutrition and culinary/hospitality curriculum. These relationships form the basic philosophical positions that influence the curriculum development within academic institutions (Elfrink & Anthony, 1995; McIntosh, 1992). In Figure 5.2., the large circle in the model represents the curriculum as a whole and reflects the competency and objectives required by educational accrediting bodies responsible for curriculum design.

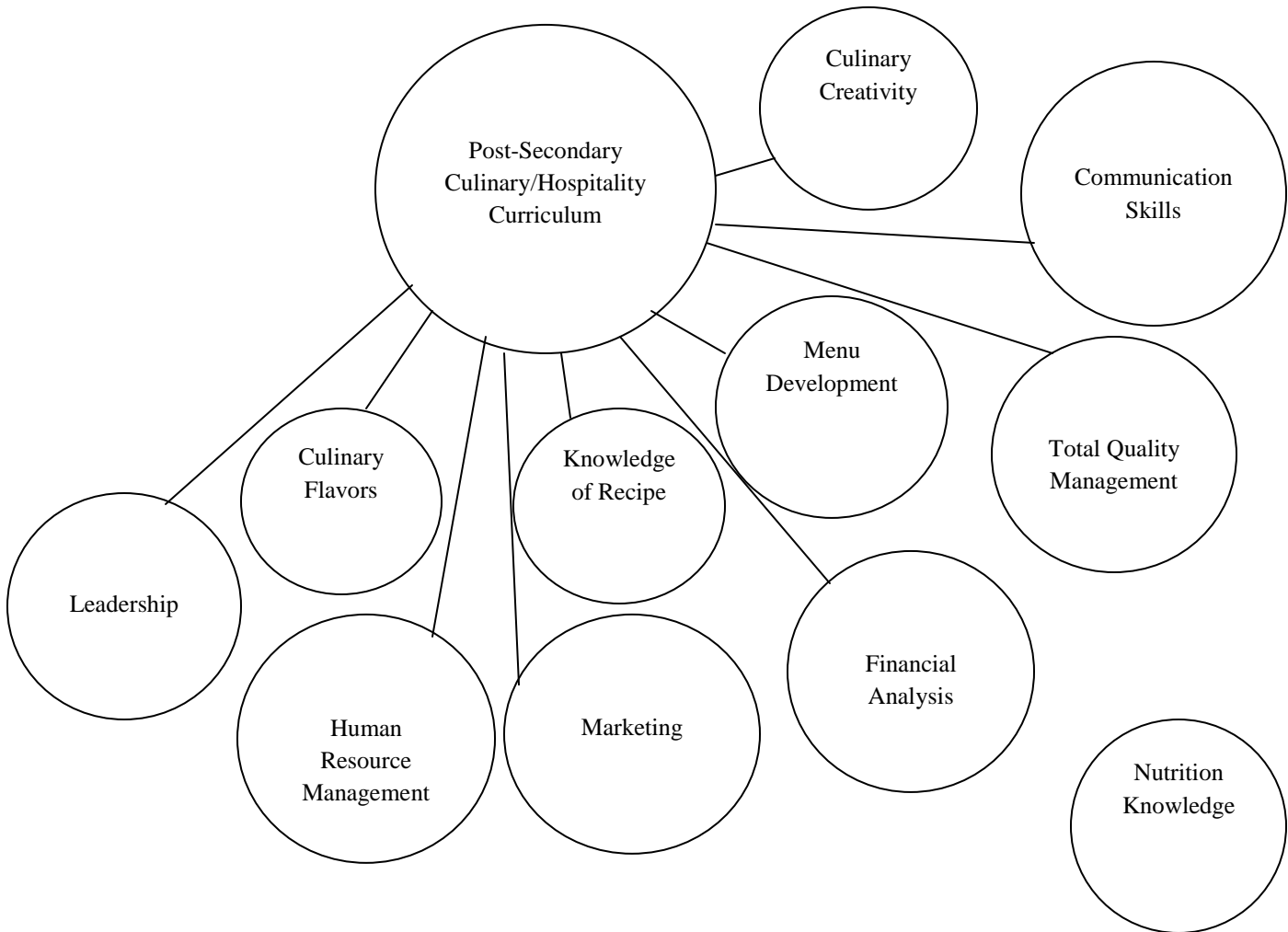
From a study by Zopiatis (2010), “the first row of smaller circles represents the requirements for a successful culinary career and denotes the competency areas essential for culinary graduates. The outer row, from a study by Umbreit (1992), illustrates six major competency areas essential for hospitality graduates. The small isolated circle represents nutrition and its current relationship to post-secondary culinary/hospitality curriculum development. Model 2 argues that nutrition is not considered to be as important as other competency areas. Therefore, this research proposes that current views and competencies are outdated and must be revised.



Figure 5.2.

Nutrition In Relation to Current Culinary/Hospitality Curriculum Design

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Research Question 2: To what degree do current stakeholders think nutritional concepts should be taught in culinary curriculum?

As illustrated in Figure 5.3., Model 3, research demonstrates a gap in agreement in regard to the level of nutritional content needed in curriculum. Experts and educators were asked if

culinary/hospitality educators need to take a more proactive role in educating future chef/foodservice personnel in nutritional concepts in order to prepare students to offer healthier menu items. The experts felt differently from educators in regard to their role in educating future chefs in nutrition and its importance to the industry:  $t(169) = -2.798, p = .006$ . Specifically, experts ( $M = 4.63, SD = .633$ ) had a significantly higher mean than educators ( $M = 4.2, SD = .719$ ). While experts and educators are not in agreement in regard to the role educators should have in educating future chefs, they do agree on the importance of competency of student's knowledge base:  $t(159) = .019, p > .05, n.s.$ ; experts ( $M = 57.8, SD = 10.86$ ), educators ( $M = 57.8; SD = 9.33$ ). This research indicates that experts and educators agree nutrition is important, but that nutrition's place in curriculum continues to be misunderstood.

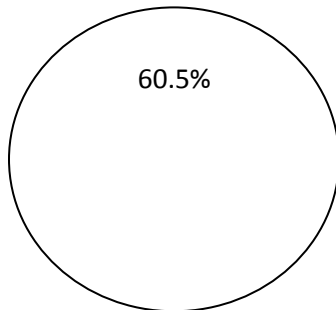
Figure 5.3.

### Nutrition and Hospitality/Culinary Curriculum Model 3: Degree to Which Nutrition Should Be Taught

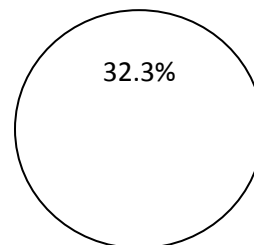
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Degree to which nutritional concepts should be included in post-secondary curriculum:

Experts



Educators



It is important for this research to determine to what degree experts and educators believe nutritional concepts should be included in post-secondary culinary curriculum. Revising

curriculum involves decisions on what content to include, as well as to what extent regional, local, and institutional perspectives should be integrated (Tribe 2002, Smith and Cooper 2000; Morgan, 2004). Curriculum success can be determined by program and course outcomes, which are achieved through proper placement of program competencies required by the industry. Determining the level of competency needed for nutrition is a difficult task, especially, when there is no established philosophical position within the educational community.

This study reveals that experts believe nutritional competency is important to a student's program of study and success depends on educators meeting these competencies. Furthermore, results also indicate that educators significantly undervalue the importance of nutritional competency placement in curriculum and overrate how well they are preparing culinary graduates, especially in comparison to experts. According to Chen and Groves (1999), it is essential to examine philosophical relationships so that the foundations of the course work and the competencies are developed for students on a long-term basis. As a result, educators have a responsibility to ensure that competencies are updated and modernized in order to meet student and industry needs.

Research Question 3: To what degree stakeholders think knowledge of nutritional concepts positively contributes to reducing obesity in public foodservice?

The responses from this question continue to support this study's argument [ $t(168) = -1.597, p > .05, n.s.$ ] that both experts ( $M = 3.82, SD = .89610$ ) and educators ( $M = 3.51, SD = 1.088$ ) are more inclined to agree that nutritional competency could affect consumer-dining behavior and reduce obesity. However, educators do not believe nutrition should be a priority when designing curriculum. Results indicate that the difference was highly significant:  $t(168) =$

-2.821,  $p < .01$ . Experts ( $M = 4.24$ ,  $SD .943$ ) rated the priority of nutritional competency significantly higher than educators ( $M = 3.76$ ,  $SD = .917$ ). Therefore, while experts feel that nutritional competencies should be a priority when designing post-secondary culinary curriculum, educators place less importance on nutritional priority when designing post-secondary culinary curriculum.

In fact, one expert stated, *“I think they (culinary students) are currently not adequately prepared. Nutrition should be integrated throughout curriculum. Repetition of these core principles will raise the level of awareness in graduates.”* General consensus among educators reflects the following sentiment from an educator, *“In two year programs, emphasis is on basic technique, understanding of methods, products, procurement, and industry in general.”* Similarly, another educator argued, *“The current curriculum does not integrate nutrition throughout the coursework. Nutrition is handled as a single course and those concepts are not utilized in other work.”* Throughout this research, it has been illustrated that experts and educators both agree that nutrition is important and has beneficial outcomes for consumers and society. However, there is disagreement between expert and educators in regard to the degree that nutritional concepts should be included in the curriculum.

In regard to Research Question 4: Possible barriers that exist and Research Question 5: What are the philosophical relationships between nutrition and culinary curricula? A good example demonstrating the lack of clarity in the philosophical position on nutrition and curriculum is that experts and educators agree that consumers are seeking healthier options,  $t(168) = -807$ ,  $p > .05$ , *n.s.* However, there is not a significant difference in both expert ( $M = 3.97$ ;  $SD = .822$ ) and educator’s ( $M = 3.86$ ;  $SD = .783$ ) opinion in this regard. When asked if, the foodservice industry

should have a proactive role in fighting rising obesity and health-related problems facing society today, both experts and educators felt similarly. In fact, both experts and educators agreed that the foodservice industry should have a proactive role in fighting obesity and related-health problems facing modern society:  $t(169) = -1.047, p > .05, n.s.$  Therefore, there is not a significant difference between experts ( $M = 4.16, SD = .886$ ) and educators ( $M = 3.97, SD = .99$ ) in this regard.

However, when asked if culinary/hospitality educators need to be trained adequately in nutritional concepts related to the current rising obesity and health problems, results showed highly significant differences in group means:  $t(169) = -10.28, p < .001$ . Experts ( $M = 4.47, SD = .762$ ) rated adequacy in nutritional training significantly higher than educators ( $M = 2.7, SD = .962$ ). Results in Phase 1 show experts and educators both believe that faculty/instructors lack the knowledge and skills necessary to teach nutritional competency and consider this a barrier to teaching nutritional competency in post-secondary culinary/hospitality curriculum.

Experts believe the knowledge of instructors is the greatest concern, and believe curriculum the second greatest concern, while educators believe curriculum design is the greatest concern and believe the lack of instructor knowledge is the second greatest concern. Regardless of the order, this data identifies areas of concern that should begin a meaningful discussion of these issues. Also significant is that educators identify a lack of resources as a major barrier to teaching nutritional competency in the curriculum, while experts believe that educators place less importance on nutritional content. Both experts and educators also agree that time limitations in the curriculum is a major barrier.

The central objective of Chapter 5 and this study is to provide an illustration of how post-secondary culinary curriculum can better accommodate the needs of modern post-secondary

culinary/hospitality curriculum practitioners. Thus far, this study has demonstrated that both experts and educators consider nutritional competency to be important. However, there is disagreement in the degree to which nutritional competencies should be included in post-secondary curriculum. This study seeks to begin a discussion on how to incorporate nutritional competencies into post-secondary culinary/hospitality curriculum. Better understanding can be achieved by combining the results from both phases of this study.

### **Development of a Model Based on Recommendations**

#### Nutrition and Hospitality/Culinary Curriculum Model 4: Integration of Nutrition

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#### **Stakeholders (Drivers of Change)**

Figure 5.4., Model 4, shows that stakeholders are primary instigators of change. Stakeholders include educators, industry leaders, foodservice providers, consumers, and government officials. Stakeholders have a vested interest and obligation to ensure that the current curriculum is meeting the modern needs of current culinary/hospitality graduates. Curriculum is designed through a combined effort, consisting of experts who offer feedback in support of the commercial foodservice industry, as well as educators who offer expertise and technical knowledge for the curriculum design.

This research has produced valuable data through responses to the open-ended questions, in addition to survey responses presented in both phases of the research. When asked in response to Research Question 4 if there are any barriers to teaching nutritional competency in the curriculum, there was consensus between both groups that barriers exist:  $t(166) = -.002, p >$

.05, *n.s.*; experts (M=3.32, SD=.93304), and educators (M=3.32, SD=1.049), Therefore, there is a similar consensus in regard to the degree that barriers exist. Responses to this research question demonstrate that both experts and educators similarly identify that barriers do exist in teaching nutritional concepts throughout post-secondary culinary curriculum, which will begin a meaningful discussion.

### **Post-Secondary Curriculum**

In Figure 5.4., Model 4 the first circle represents all competencies, as well as learning objectives and the goals of post-secondary culinary/hospitality curriculum. This circle further represents competencies compiled and developed by the ACFEF in order to guide curriculum development in post-secondary culinary/hospitality programs. The curriculum represents curriculum content (currently taught in post-secondary culinary/hospitality programs) and the relationship nutrition has in current curriculum design.

### **A Discussion on the Levels of Agreement and Disagreement**

The different levels of agreement and disagreement form starting points for discussion on what should be taught in post-secondary curriculum and the identification of barriers. The identified barriers can form the basis for meaningful discussion and can also identify how to overcome barriers to teaching nutritional competencies. These barriers identified through the implementation of proven theories provide recommendations on how to better integrate nutritional competencies into post-secondary curriculum. These recommendations are discussed below.

### **Barriers**

Arguably, the most promising findings from this investigation is the consensus that barriers exist to teaching nutritional concepts. Not only do both groups agree that barriers exist, but experts and educators also ranked items in similar order from barriers, to teaching nutritional concepts. Specifically, identified barriers are:

- 1) a lack of instructor knowledge in teaching nutritional competency,
- 2) a lack of time and placement of nutritional competency in curriculum, and
- 3) a lack of student/instructor interest in nutrition.

These findings could indicate that educators do agree about the importance of nutritional concepts, but are overwhelmed by the barriers and the lack of support for teaching these competencies. As this study emphasizes, there are definable philosophical relationships within the curriculum that establish nutrition competency. However, if competencies are not correctly prioritized, then barriers should be used as a guideline to form new philosophical positions on the support of culinary competency in the post-secondary culinary curriculum design. The following recommendations have been summarized based on barriers identified by experts and educators to teaching nutritional competency in post-secondary culinary/hospitality curriculum. In Figure 5.4., Model 4, the first cluster of circles represents barriers identified by experts and educators with recommendations.

## **Recommendations**

### **Knowledge:**

- 1) Require newly hired faculty/instructors to possess the qualifications required to teach nutritional competency.



2) Provide continual education for current faculty.

3) Encourage chef instructors and dietitians to team teach curriculum.

**Importance:**

1) Revise philosophical positions on the importance of nutritional competency in curriculum.

2) Stress the importance of nutritional competency to faculty.

**Resources:**

1) Revise philosophical position on the importance of nutritional competency in the design of curriculum to ensure proper allocation of resources.

**Time:**

1) Revise the curriculum to better meet the needs of faculty, students, and stakeholders in order to make nutritional competency an integral part of the curriculum.

2) Revise the philosophical position on the importance of nutritional competency in the curriculum.

**Tradition:**

1) Train and re-train the faculty giving them new skills and teaching methodologies to better meet current student needs.

**Commitment:**

1) Provide funding for continual education opportunities designed to enhance nutritional knowledge and teaching methods for faculty and staff.

2) Revise philosophical position on the importance of nutritional competency in the curriculum.

### **Implementation**

In figure 5.4., Model 4, the larger circle represents the process of implementing the recommendations developed from the identified barriers. This process creates a philosophical position on how to make the appropriate changes based on recommendations provided by experts, educators, and relevant stakeholders.

These stakeholders include culinary and hospitality accrediting bodies that have formed a consensus on the process of rectifying the lack of nutritional competency in curriculum. This consensus and subsequent implementation would address all of the defined problems outlined in this research and would integrate nutritional competency throughout post-secondary culinary/hospitality curriculum.

### **Benefactors**

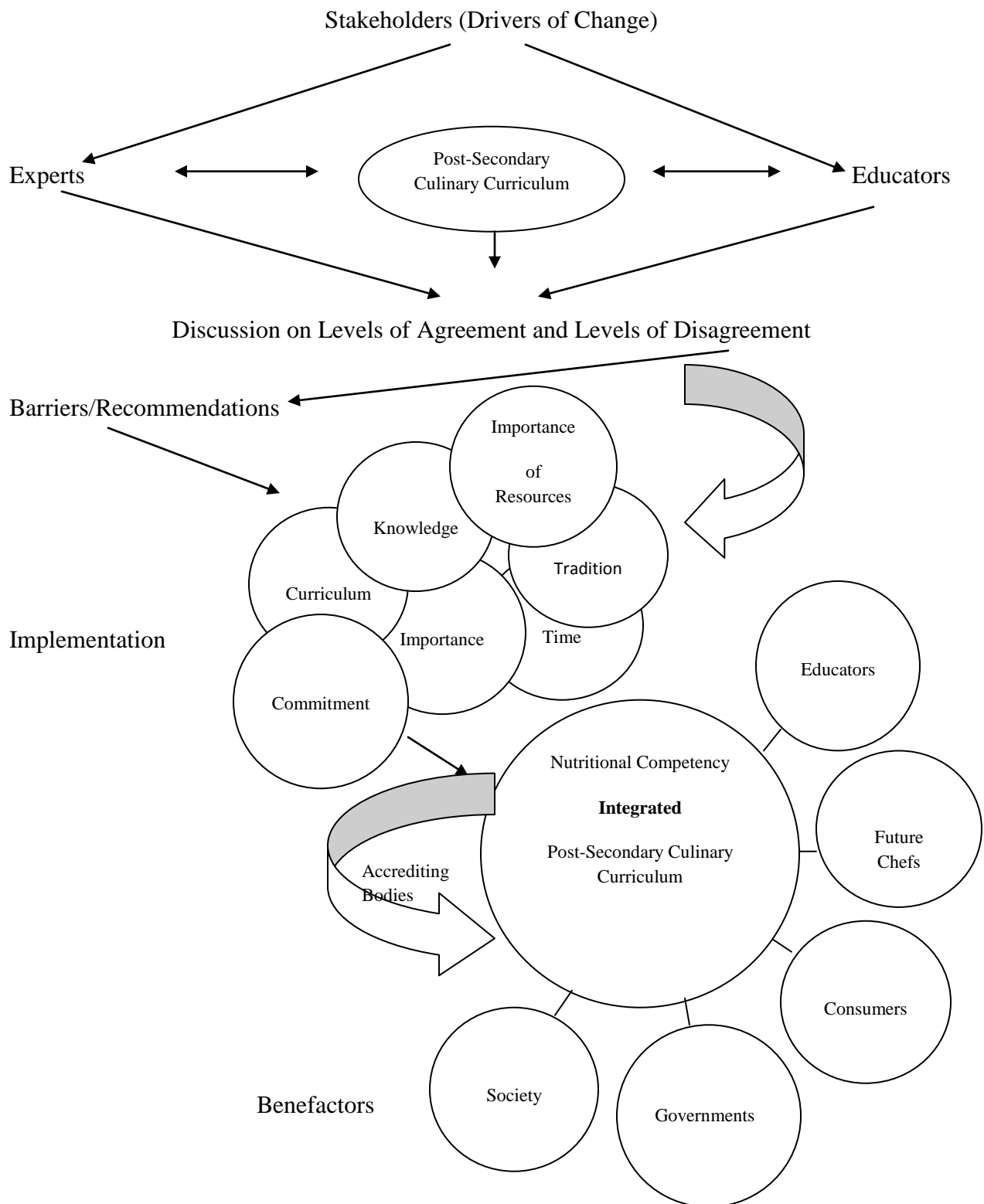
Benefactors include all stakeholders, which includes educators, industry leaders, foodservice providers, consumers, government officials, as well as society would benefit from the transformation of curriculum design and would be able include nutritional competency in curriculum to the extent deemed by this research.

Figure 5.4., Model 4 illustrates the steps to integrate nutritional competency into main stream post-secondary culinary/hospitality curriculum based on recommendations as a result of this research. Recommendations in Model 4 represent both experts and educators responses to open-ended questions and survey responses.

Figure 5.4.

Nutrition and Hospitality/Culinary Curriculum Model 4: Integration of Nutrition

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## Implications

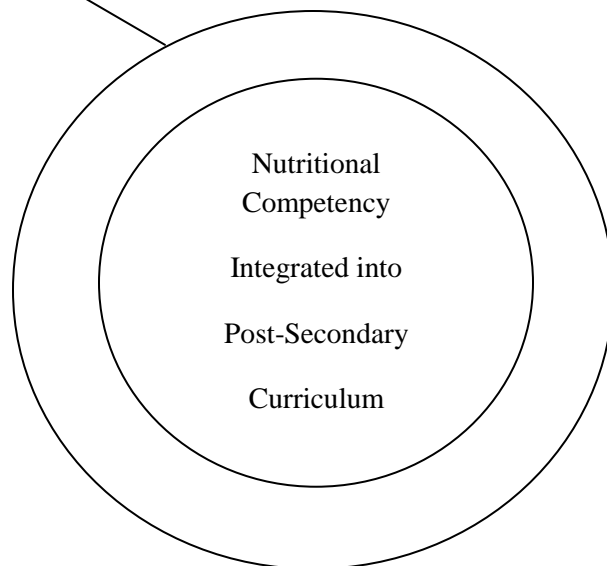
It is essential to examine philosophical relationships so that the foundations of course work and related competencies may be developed on a well-founded, long-term basis. The construction of a philosophical position would be useful to culinary organizations, hospitality units, and the authors of curriculum materials. A philosophical position would help educators clarify their ultimate teaching objectives and views on curriculum development, and it would also allow educators to better articulate the ways their academic direction and materials contribute to the foodservice industry (Chen & Groves, 1999).

Figure 5.5.

Nutrition and Hospitality/Culinary Curriculum Model 5, Implications of Nutrition Integration

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Post-Secondary Culinary/Hospitality Curriculum Design



Different kinds of philosophies produce various objectives and goals in the curriculum design. By defining the relationship between nutrition and post-secondary culinary curriculum, stakeholders will have a better understanding of how curriculum can better meet industry needs. The implementation of this research will have approval by the accrediting bodies of culinary/hospitality programs that develop curriculum through competencies compiled and developed by the ACFEF. Through the implementation of this research, educators will have a better understanding of the relationship nutrition has with curriculum design and, therefore, will spur meaningful changes in curriculum design based on recommendations.

### **Limitations**

As with any research, the discussions within this study have some limitations and generate questions for future research. First, the literature review in the section concerning curriculum and curriculum design primarily relied on literature discussing competency related to overall curriculum design (i.e., knowledge of recipe, menu development, overall learning, and program satisfaction) but lacked a review of literature that specified nutritional competency. The explanation for this deficient is the lack of research in this area. Future research would benefit from studies addressing the topic nutrition in the design of curriculum.

Second, the Delphi technique modified to include components of grounded theory methodology was employed in this study due to time, limited resources, and scope of this research. In using grounded theory, the coding and fracturing of data did provide the study with valuable insight; however, the data was taken from transcript and not actual face-to-face interviews which is a component of grounded theory research. Provided the opportunity to meet

face-to-face with educators and stakeholders could have provided better insight and meaningful data. Future research would benefit from including face-to-face interviews when using grounded theory methodology.

Third, the response rate that every research should pursue is 100%. However, due to the nature of gathering data and the inherent difficulties of getting all participants to return surveys has proved to be challenging. Groves, Cialdini and Courier (1992) reported that the US population is being over surveyed: the growth in the amount of survey research being undertaken has resulted in an increase in the number of request to individuals to complete surveys (p. 475). The overall response rate from Phase 2 of the research was 26%. The lower response rate may be attributed to the complexity of the online survey, the time required to complete the survey and the time period the survey was administrated.

Fourth, the final sample of respondents only includes educators and experts who support the commercial foodservice industry. In order to fully understand the obesity crises and its effect on the development of post-secondary culinary/hospitality curriculum, data from graduate students in culinary/hospitality programs must also be collected, as well as data from consumers who purchase commercial food. Finally, data must also be collected from a larger scope of employers in the foodservice industry in order to accurately capture the extent of the problem.

## **Conclusions**

This research reveals that a strong philosophical relationship does exist. Philosophically, both experts and educators believe that nutrition competency is important to post-secondary culinary/hospitality curriculum and to a student's success in the foodservice industry. However,

this relationship is not present in the planning or design of the curriculum. Therefore, it can be concluded that nutritional concepts are currently not being properly taught in post-secondary culinary curriculum to the extent required by stakeholders.

Stakeholders (such as educators, industry leaders, foodservice providers, consumers, and government officials) have identified a serious problem facing modern society in the fight against rising obesity. There is endless evidence indicating that the foodservice industry has greatly contributed to the obesity crisis. Previous studies argue that there are correlations between various aspects of the commercial dining industry and the occurrence of obesity. This includes a positive correlation between the frequency of fast food consumption and the occurrence of obesity (Anderson, Rafferty, Lyon-Callo & Imes, 2011). This trend will likely continue unless more emphasis is placed on nutrition in the commercial foodservice industry.

This study relies heavily on the knowledge and expertise of the Delphi panel in order to establish to what degree current post-secondary curriculum should include nutritional concepts. Delphi members were asked to compose a nutritional position statement on the ideal level of nutritional competency in post-secondary culinary curriculum. The following is a list of those Delphi panel responses:

- *Every student participating in the post-secondary culinary curriculum should demonstrate a complete understanding and strong foundation in relation to food to prepare them for the current and emerging nutritional issues they will encounter in the future careers.*
- *Culinary nutrition woven throughout lecture and labs for all culinary arts and baking pastry students is a necessary tool for them to meet needs of the dining public.*

- *With an aging population, the high rate of obesity, and growing allergy concerns, culinary professionals have a significant role and responsibility to fully understand dietary principles in order to service the public and become a trusted source for serving food that meets customer nutritional needs. Post-secondary curriculum and related competencies must meet this growing demand in order to be marketable and provide the foods necessary to keep the general public healthy.*

All groups involved in this research, whether experts or educators, represent the hospitality/culinary community and are leaders in their respective institutions. This gives reliability and validity to the outcomes presented in this research. The results indicate that there is agreement between experts and educators on the importance of nutritional competency in the student knowledge base. Both groups agree that the foodservice industry should have a proactive role that consumers are seeking healthier foods, and, most importantly, that barriers do exist and have been identified by both groups.

Similarly, there are numerous areas in this research demonstrating significant differences in opinions. For instance, educators rate student preparation higher than experts, while educators place a lower degree of importance than experts on nutrition in the curriculum design. In addition, experts feel strongly that educators need better nutrition training in order to teach these concepts successfully, while educators rate this lower, which indicates they feel adequately trained in nutritionally related concepts

This research concludes that educators, with input from stakeholders, should revolutionize post-secondary culinary curriculum and the pedagogy used to teach post-secondary culinary and hospitality students in order to make nutrition a priority in the foodservice industry. The results



confirm that both experts and educators support the inclusion of nutrition competency in the curriculum and that both groups feel similarly about the degree to which nutritional competencies should be integrated into curriculum.

However, the barriers identified in this study are affecting how nutritional concepts are being incorporated into the curriculum. This is due part to the absence of a defined philosophical position. Based on the outcomes of this research, stakeholders must reevaluate the role nutrition plays in post-secondary culinary curriculum and determine if curricula should be revised to reflect the modern needs and issues of the 21<sup>st</sup> century.

These relationships form the basic philosophical positions that influence the development of the curriculum within academic institutions (Elfrink & Anthony, 1995; McIntosh, 1992). A new culinary curriculum design should integrate nutritional concepts throughout the curriculum. This entails the development of a new culinary paradigm requiring support from all stakeholders. As a result, internal administration, faculty pressures, external pressures in the professional world and societal needs must be considered in formulating the position of each institution (Schmidgall & Woods, 1994; Schulmen & Greenberg, 1994). In short, new curriculum should take into consideration the changes and challenges faced in modern society.

### **Directions for Future Research**

Due to limited research in the area of nutrition and curriculum design, this research focuses primarily on how to begin a discussion on these issues. Therefore, this study recommends that research be continued in a number of areas to create a better understanding. This includes the following in regard to further research:

1. Research should be extensively conducted within the industry to determine if culinary graduates are meeting the needs of employers in the foodservice industry.
2. Research should be conducted to determine the actual nutritional knowledge of graduates in post-secondary culinary programs.
3. Research must further explore the level of consumer desire for healthier food in commercial foodservice environments.
4. Outcomes from this research if properly employed should be evaluated to determine if positive environmental and US. Government policy interventions resulted as a result of this research.

Finally, this study recommends that educators, educational institutions, stakeholders, and accrediting agencies continue the discussion of integrating nutrition into post-secondary culinary/hospitality curriculum. Furthermore, research should continue to be conducted to determine if any philosophical position is being followed when designing culinary curriculum. If a philosophical position has not been established by an institution or its faculty, then it is critical to continue research to determine the impact of a lack of a philosophical position on curriculum and student learning outcomes (Chen & Groves, 1999).

### **Summary**

This research has been conducted to identify the philosophical relationships between nutrition and culinary curricula. Additionally, this research seeks to identify gaps and barriers between curriculum nutritional needs identified by stakeholders and the actual nutritional content offered in current post-secondary culinary current programs.

This study has been conducted in a manner consistent with quality research. All methods and procedures have been followed to provide valuable data that can form a platform for future research of the relationship between nutrition and curriculum design.

While it is clear that nutrition is important in post-secondary curriculum design, the importance of placement in the curriculum is unclear. Supported by the data collected in this research, the findings of this study will provide better understanding for both academic and culinary industry stakeholders in regard to how nutrition contents fits into overall curriculum design. Moreover, it will further emphasize to relevant stakeholders, that the complexity of nutritional concepts should be integrated throughout the current post-secondary culinary/hospitality curriculum.

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**(Appendix 1-Institutional Review Board Approval)**

**AUBURN UNIVERSITY INSTITUTIONAL REVIEW BOARD for RESEARCH INVOLVING HUMAN SUBJECTS  
RESEARCH PROTOCOL REVIEW FORM**

For Information or help contact **THE OFFICE OF RESEARCH COMPLIANCE**, 115 Ramsay Hall, Auburn University  
Phone: 334-844-5966 e-mail: hsubjec@auburn.edu Web Address: <http://www.auburn.edu/research/vpr/ohs/>

Revised 03.26.11 – DO NOT STAPLE, CLIP TOGETHER ONLY.

Save a Copy

1. PROPOSED START DATE of STUDY: Jun 15, 2013

PROPOSED REVIEW CATEGORY (Check one):      FULL BOARD      EXPEDITED       EXEMPT

2. PROJECT TITLE: Integration of nutrition in the post-secondary culinary curriculum: designing a model

3. Joseph D. Mitchell      graduate student      HRMT      (205) 821-3078      mitchj4@auburn.edu  
**PRINCIPAL INVESTIGATOR**      **TITLE**      **DEPT**      **PHONE**      **AU E-MAIL**

328 Spidle Hall, Auburn University      (334) 844-8196      jmitch8354@aol.com  
**MAILING ADDRESS**      **FAX**      **ALTERNATE E-MAIL**

4. SOURCE OF FUNDING SUPPORT:     Not Applicable     Internal     External Agency: \_\_\_\_\_     Pending     Received

5. LIST ANY CONTRACTORS, SUB-CONTRACTORS, OTHER ENTITIES OR IRBs ASSOCIATED WITH THIS PROJECT:

None

6. GENERAL RESEARCH PROJECT CHARACTERISTICS

6A. Mandatory CITI Training	6B. Research Methodology								
<p><b>Names of key personnel who have completed CITI:</b>  <u>Dr. Baker Ayoun</u>      <u>Joseph D. Mitchell</u>            _____            _____</p> <p align="center"><b>CITI group completed for this study:</b>  <input checked="" type="checkbox"/> Social/Behavioral    <input type="checkbox"/> Biomedical</p> <p align="center"><b>PLEASE ATTACH TO HARD COPY ALL CITI CERTIFICATES FOR EACH KEY PERSONNEL</b></p>	<p><b>Please check all descriptors that best apply to the research methodology.</b></p> <p>Data Source(s):    <input checked="" type="checkbox"/> New Data      <input type="checkbox"/> Existing Data</p> <p>Will recorded data directly or indirectly identify participants?                                                     Yes      <input checked="" type="checkbox"/> No</p> <p>Data collection will involve the use of:</p> <p><input type="checkbox"/> Educational Tests (cognitive diagnostic, aptitude, etc.)  <input type="checkbox"/> Interview / Observation  <input type="checkbox"/> Physical / Physiological Measures or Specimens (see Section 6E.)  <input checked="" type="checkbox"/> Surveys / Questionnaires  <input type="checkbox"/> Internet / Electronic  <input type="checkbox"/> Audio / Video / Photos  <input type="checkbox"/> Private records or files</p>								
6C. Participant Information	6D. Risks to Participants								
<p><b>Please check all descriptors that apply to the participant population.</b>  <input checked="" type="checkbox"/> Males    <input checked="" type="checkbox"/> Females    <input type="checkbox"/> AU students</p> <p><b>Vulnerable Populations</b>  <input type="checkbox"/> Pregnant Women/Fetuses    <input type="checkbox"/> Prisoners  <input type="checkbox"/> Children and/or Adolescents (under age 19 in AL)</p> <p><b>Persons with:</b></p> <p><input type="checkbox"/> Economic Disadvantages      <input type="checkbox"/> Physical Disabilities  <input type="checkbox"/> Educational Disadvantages      <input type="checkbox"/> Intellectual Disabilities</p> <p><b>Do you plan to compensate your participants?</b>    <input checked="" type="checkbox"/> Yes    <input type="checkbox"/> No</p>	<p><b>Please identify all risks that participants might encounter in this research.</b></p> <table style="width:100%; border: none;"> <tr> <td style="border: none;"><input type="checkbox"/> Breach of Confidentiality*</td> <td style="border: none;"><input type="checkbox"/> Coercion</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Deception</td> <td style="border: none;"><input type="checkbox"/> Physical</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Psychological</td> <td style="border: none;"><input type="checkbox"/> Social</td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> None</td> <td style="border: none;"><input type="checkbox"/> Other:</td> </tr> </table> <p>_____            _____</p> <p><small>*Note that if the investigator is using or accessing confidential or identifiable data, breach of confidentiality is always a risk.</small></p>	<input type="checkbox"/> Breach of Confidentiality*	<input type="checkbox"/> Coercion	<input type="checkbox"/> Deception	<input type="checkbox"/> Physical	<input type="checkbox"/> Psychological	<input type="checkbox"/> Social	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
<input type="checkbox"/> Breach of Confidentiality*	<input type="checkbox"/> Coercion								
<input type="checkbox"/> Deception	<input type="checkbox"/> Physical								
<input type="checkbox"/> Psychological	<input type="checkbox"/> Social								
<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:								
<p><b>Do you need IBC Approval for this study?</b>    <input checked="" type="checkbox"/> No    <input type="checkbox"/> Yes - BUA # _____    Expiration date _____</p>									

FOR OHSR OFFICE USE ONLY	
DATE RECEIVED IN OHSR: _____ by _____	PROTOCOL # _____
DATE OF IRB REVIEW: _____ by _____	APPROVAL CATEGORY: _____
DATE OF IRB APPROVAL: _____ by _____	INTERVAL FOR CONTINUING REVIEW: _____
COMMENTS:	

**7. PROJECT ASSURANCES**

**PROJECT TITLE:** Integration of nutrition in the post-secondary culinary curriculum: designing a model

**A. PRINCIPAL INVESTIGATOR'S ASSURANCES**

1. I certify that all information provided in this application is complete and correct.
2. I understand that, as Principal Investigator, I have ultimate responsibility for the conduct of this study, the ethical performance this project, the protection of the rights and welfare of human subjects, and strict adherence to any stipulations imposed by the Auburn University IRB.
3. I certify that all individuals involved with the conduct of this project are qualified to carry out their specified roles and responsibilities and are in compliance with Auburn University policies regarding the collection and analysis of the research data.
4. I agree to comply with all Auburn policies and procedures, as well as with all applicable federal, state, and local laws regarding the protection of human subjects, including, but not limited to the following:
  - a. Conducting the project by qualified personnel according to the approved protocol
  - b. Implementing no changes in the approved protocol or consent form without prior approval from the Office of Human Subjects Research
  - c. Obtaining the legally effective informed consent from each participant or their legally responsible representative prior to their participation in this project using only the currently approved, stamped consent form
  - d. Promptly reporting significant adverse events and/or effects to the Office of Human Subjects Research in writing within 5 working days of the occurrence.
5. If I will be unavailable to direct this research personally, I will arrange for a co-investigator to assume direct responsibility in my absence. This person has been named as co-investigator in this application, or I will advise OHSR, by letter, in advance of such arrangements.
6. I agree to conduct this study only during the period approved by the Auburn University IRB.
7. I will prepare and submit a renewal request and supply all supporting documents to the Office of Human Subjects Research before the approval period has expired if it is necessary to continue the research project beyond the time period approved by the Auburn University IRB.
8. I will prepare and submit a final report upon completion of this research project.

My signature indicates that I have read, understand and agree to conduct this research project in accordance with the assurances listed above.

Joseph D. Mitchell

Printed name of Principal Investigator

*Joseph D. Mitchell*  
Principal Investigator's Signature  
(SIGN IN BLUE INK ONLY)

June 19, 2013  
Date

**B. FACULTY ADVISOR / SPONSOR'S ASSURANCES**

1. By my signature as faculty advisor/sponsor on this research application, I certify that the student or guest investigator is knowledgeable about the regulations and policies governing research with human subjects and has sufficient training and experience to conduct this particular study in accord with the approved protocol.
2. I certify that the project will be performed by qualified personnel according to the approved protocol using conventional or experimental methodology.
3. I agree to meet with the investigator on a regular basis to monitor study progress.
4. Should problems arise during the course of the study, I agree to be available, personally, to supervise the investigator in solving them.
5. I assure that the investigator will promptly report significant adverse events and/or effects to the OHSR in writing within 5 working days of the occurrence.
6. If I will be unavailable, I will arrange for an alternate faculty sponsor to assume responsibility during my absence, and I will advise the OHSR by letter of such arrangements. If the investigator is unable to fulfill requirements for submission of renewals, modifications or the final report, I will assume that responsibility.
7. I have read the protocol submitted for this project for content, clarity, and methodology.

Dr. Baker Ayoun

Printed name of Faculty Advisor / Sponsor

*Baker Ayoun*  
Signature (SIGN IN BLUE INK ONLY)

June 19, 2013  
Date

**C. DEPARTMENT HEAD'S ASSURANCE**

By my signature as department head, I certify that I will cooperate with the administration in the application and enforcement of all Auburn University policies and procedures, as well as all applicable federal, state, and local laws regarding the protection and ethical treatment of human participants by researchers in my department.

Dr. Martin O'Neill

Printed name of Department Head

*Martin O'Neill*  
Signature (SIGN IN BLUE INK ONLY)

6/20/13  
Date



**(Appendix 2-Telephone Recruitment Script)**

TELEPHONE RECRUITMENT SCRIPT

My name is Joseph Mitchell, a graduate student from the Department of Hotel and Restaurant Management at Auburn University. I would like to invite you to participate in my research study that employs the use of a Delphi technique to learn more about the relationships between nutrition and culinary post-secondary curriculum and what barriers exist in teaching nutritional concepts as a part of a culinary post-secondary curriculum.

You have been selected because of your background and professional standing in the community and are considered to be an expert in this area.

If you agree to participate, you will be asked to allow collectively 2-3 hours total time spread out over four to six weeks. The length of time is due to the nature of the Delphi research technique used. There is no risk associated with participating in the study and your identity will remain anonymous if this is your choice.

You may participate if you feel that you do have extensive knowledge in the areas of nutrition, culinary post-secondary curriculum and the foodservice industry that would be beneficial to the study. Please do not participate if you do not think your input would not be beneficial for the study at this time. Do you have any question now? If you have questions later, please contact me at +1 205-821-3078 or you may contact my advisor, Dr. Baker Ayoun, at +1 334-844-8196.

Thank you

### **(Appendix 3-Delphi Recruitment Letter)**

(The Auburn University Institutional Review Board has approved this document for use from 6/28/13 to 6/27/16 Protocol #13-245 EX1306)

#### INFORMATION LETTER

For a Research Study entitled

*“Integration of nutrition in the post-secondary culinary curriculum: designing a model”*

You are invited to participate in a research study which involves the use of a Delphi technique; the Delphi technique is a structured process that uses a series of questionnaires or rounds to gather information which is continued until group consensus is reached. The study surveys the relationships between nutrition and culinary curricula and what barriers or/and obstacles exists in teaching nutritional concepts as part of a culinary post-secondary curriculum. The study is being conducted by Joseph D. Mitchell under the direction of Dr. Baker Ayoun in the Hotel and Restaurant Management Program at Auburn University, U.S.A. You were selected as a possible participant because of your background and expert knowledge in one or all of the following areas: nutrition, culinary post-secondary curriculum and the foodservice industry.

If you decide to participate in this research study, you will be asked a set of questions concerning nutritional concepts and competencies being taught in post-secondary culinary programs and what barriers and obstacles exist in teaching culinary post-secondary curriculum. Your total time commitment will be approximately 1-1.5 hours total time spread out over the course of two to three weeks. The length of time is needed due to the nature of the Delphi process. There is no risk associated with participating in this study greater than those encountered in daily life.

If you participate in this study and provide your contact information, you can expect to receive a summary of the study results.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your relationship with the researcher or Auburn University.

Any data obtained in connection with this study will remain anonymous. The results of the research study will be used to fulfill an educational requirement but may be published, but your identity will not be associated with your responses in any published format.

If you have any questions about this study, please feel free to call the researchers at +1 205-821-3078 or send email to [mitchj4@auburn.edu](mailto:mitchj4@auburn.edu) .If you have questions about your right as a research participant, you may contact the Auburn University Office of Human Subjects or the Institutional Review Board by phone (334)-844-5966 or email at [hsubject@auburn.edu](mailto:hsubject@auburn.edu) or [IRBChair@auburn.edu](mailto:IRBChair@auburn.edu) .

HAVING READ THE INFORMATION ABOVE, YOU MUST DECIDE IF YOU WANT TO PARTICPATE IN THIS RESEARCH PROJECT. IF YOU DECIDED TO PARTICIPATE, PLEASE CLICK ON THIS LINK <https://www.surveymonkey.com/s/QCS2DNN> TO ACCESS THE SURVEY:  
YOU MAY PRINT A COPY OF THIS LETTER TO KEEP.

## **(Appendix 4-Educators Recruitment Letter)**

The Auburn University Institutional Review Board has approved this document for use from 6/28/13 to 6/27/16, Protocol # 13-245 EX 1306

### INFORMATION LETTER

For a Research Study entitled

*“Integration of nutrition in the post-secondary culinary curriculum: designing a model”*

You are invited to participate in a research study which surveys the relationships between nutrition and culinary curricula. The study is being conducted by Joseph D. Mitchell, Program Director, Culinary and Hospitality Management Program at Jefferson State Community College, Birmingham Alabama, under the direction of Dr. Baker Ayoun from the Hotel and Restaurant Management Program at Auburn University, U.S.A. You were selected as a possible participant because you are a Hospitality/culinary director/coordinator responsible for culinary curriculum development or teach in a post-secondary culinary/hospitality program.

If you decide to participate in this research study, you will be asked a set of questions concerning your program’s curriculum and to what degree nutrition is included as part of the curriculum. Part of the study will look at what barriers and obstacles exist in teaching nutritional concepts as part of post-secondary culinary curriculum. Your total time commitment will be approximately 10-15 minutes. There is no risk associated with participating in this study greater than those encountered in daily life.

If you participate in this study your name will be entered into a drawing for one of four prepaid Amazon.com cards valued at fifty dollars each administered through SurveyMonkey.com, if you provide your contact information, you can expect to receive a summary of the study results.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with the researcher or Auburn University.

Any data obtained in connection with this study will remain anonymous. The results of the research study are used to fulfill an educational requirement and may be published, but your identity will not be associated with your responses in any published format.

If you have any questions about this study, please feel free to call the researchers at +1 205-821-3078 or send email to [mitchj4@auburn.edu](mailto:mitchj4@auburn.edu) .

If you have questions about your right as a research participant, you may contact the Auburn University Office of Human Subjects or the Institutional Review Board by phone (334)-844-5966 or email at [hsubject@auburn.edu](mailto:hsubject@auburn.edu) or [IRBChair@auburn.edu](mailto:IRBChair@auburn.edu) .

HAVING READ THE INFORMATION ABOVE, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDED TO PARTICIPATE, PLEASE CLICK THIS LINK <https://www.surveymonkey.com/s/SSWD8RX> TO ACCESS THE SURVEY:

**(Appendix 5- Pilot Recruitment Letter)**

The Auburn University Institutional Review Board has approved this document for use from 6/28/13 to 6/27/16 Protocol #13-245 EX1306)

INFORMATION LETTER

For a Research Study entitled

*“Integration of nutrition in the post-secondary culinary curriculum: designing a model”*

You are invited to participate in a "Pilot" research study which surveys the relationships between nutrition and culinary curricula. The goal of this phase of the research is to test the methods and procedures to be used on a larger scale.

The study is being conducted by Joseph D. Mitchell under the direction of Dr. Baker Ayoun from the Hotel and Restaurant Management Program at Auburn University, U.S.A. You were selected as a possible participant because you are a Hospitality/culinary director/coordinator responsible for culinary curriculum development, teach in a post-secondary culinary/hospitality program, or in the case of this pilot study have skills and knowledge that could be beneficial to the development of this survey instrument.

If you decide to participate in this research study, you will be asked a set of questions concerning your program’s curriculum and to what degree nutrition is included as part of the curriculum. Part of the study will look at what barriers and obstacles exist in teaching nutritional concepts as part of post-secondary culinary curriculum. Your total time commitment will be approximately 15 minutes. There is no risk associated with participating in this study greater than those encountered in daily life.

Any data obtained in connection with this study will remain anonymous. The results of the research study will be used to fulfill an educational requirement but may be published, but your identity will not be associated with your responses in any published format.

If you have any questions about this study, please feel free to call the researchers at +1 205-821-3078 or send email to [mitchj4@auburn.edu](mailto:mitchj4@auburn.edu)

HAVING READ THE INFORMATION ABOVE, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDED TO PARTICIPATE, PLEASE CLICK ON THIS LINK TO ACCESS THE SURVEY:

<https://www.surveymonkey.com/s/CLBBZPK>

YOU MAY PRINT A COPY OF THIS LETTER TO KEEP.

**(Appendix 6- Survey Ending Notice Email)**

The Auburn University Institutional Review Board has approved this document for use from 6/28/13 to 6/27/16, Protocol # 13-245 EX 1306

This email is to notify survey participants of ending date to complete survey for the research study entitled:

*“Integration of nutrition in the post-secondary culinary curriculum: designing a model”*

Final date for completion is December 16<sup>th</sup> 2013. For those of you that was able to complete the survey thank you again for your valuable input and knowledge on this important topic on the relationship between nutrition and culinary curricula.

If you have not had the opportunity to complete the survey and you teach and are responsible for curriculum in post-secondary culinary curriculum please consider completing the survey by clicking this link to access the survey: <https://www.surveymonkey.com/s/SSWD8RX> We need your valuable input on this topic; Thank you again for your time and enjoy your holiday break!

**(Appendix 7-Delphi Coding Responses)**

Coding –Delphi Technique: Responses to barriers to teaching nutritional competencies	
Categories /Data	
<p><b>Knowledge-22</b></p> <ul style="list-style-type: none"> <li>• Lack of knowledge on instructors part</li> <li>• Skills to teach</li> <li>• Instructor knowledge</li> <li>• Qualified nutrition educators</li> <li>• Access to information</li> <li>• Lack of knowledge of instructors</li> <li>• Lack of nutrition education thus far with current instructors</li> <li>• Finding qualified instructors</li> <li>• Common core of nutrition knowledge</li> <li>• The training of the instructor to best relate the nutritional competencies to the student</li> <li>• Past experience in the preparation of food service recipes</li> <li>• Inadequate nutrition knowledge of faculty</li> <li>• Real or perceived gap between chefs and dietitians/nutritionists</li> <li>• Knowledge level of instructor</li> <li>• Qualified instructors</li> <li>• Nutritional knowledge of instructors</li> <li>• Educational limits by the instructor (instructors qualification)</li> <li>• Educators being competent in nutrition</li> <li>• Lack of nutrition knowledge of faculty</li> <li>• Instructors are not educated on subject</li> <li>• Lack of nutrition education thus far with current instructors</li> <li>• There aren't enough knowledgeable instructor</li> </ul>	<p><b>Knowledge Subcategories</b></p> <p><b>Subcategory 1: Lack of knowledge</b></p> <ul style="list-style-type: none"> <li>• Lack of knowledge on instructors part</li> <li>• Instructor knowledge</li> <li>• Lack of knowledge of instructors</li> <li>• Lack of nutrition education thus far with current instructors</li> <li>• Common core of nutrition knowledge</li> <li>• Inadequate nutrition knowledge of faculty</li> <li>• Knowledge level of instructor</li> <li>• Nutrition knowledge of instructors</li> <li>• Lack of nutrition knowledge of faculty</li> <li>• There aren't enough knowledgeable instructors</li> </ul> <p><b>Subcategory 2: Skills to teach</b></p> <ul style="list-style-type: none"> <li>• Skills to teach</li> <li>• Training of the instructor to best relate the nutritional competencies to the student</li> </ul> <p><b>Subcategory 3: Qualifications</b></p> <ul style="list-style-type: none"> <li>• Qualified nutrition educators</li> <li>• Finding qualified instructors</li> <li>• Qualified instructors</li> <li>• Educational limits by the instructor (instructors qualification)</li> <li>• Instructors not educated on the subject</li> <li>• Lack of nutrition education thus far with current instructors</li> </ul> <p><b>Subcategory 4: Experience</b></p> <ul style="list-style-type: none"> <li>• Past experience in healthy preparation of food service recipes</li> <li>• Real or perceived gap between chefs and dietitian/nutritionists</li> <li>• Educators being competent in nutrition</li> </ul>
<p><b>Curriculum -18</b></p> <ul style="list-style-type: none"> <li>• Cooking fundamentals at times does not allow us</li> <li>• Not enough time in curriculum</li> <li>• Lack of time in curriculum</li> <li>• Lack of time with already loaded curriculum</li> <li>• Hours available in curriculum</li> <li>• Time within program</li> <li>• Time</li> <li>• Credit hour restriction</li> <li>• Hours allocated by the program competency of students</li> </ul>	<p><b>Curriculum Subcategories</b></p> <p><b>Subcategory 1: Time</b></p> <ul style="list-style-type: none"> <li>• Cooking fundamentals at time does not allow us</li> <li>• Not enough time in curriculum</li> <li>• Lack of time in curriculum</li> <li>• Lack of time in already loaded curriculum</li> <li>• Hours available in curriculum</li> <li>• Time within program</li> <li>• Time</li> <li>• Lack of time in an already loaded curriculum</li> <li>• Time required for other Skill/competencies</li> </ul>

<ul style="list-style-type: none"> <li>• Lack of time is an already loaded curriculum</li> <li>• Time required for other skill/competencies</li> <li>• Understanding needs of competencies</li> <li>• Current degree requirements</li> <li>• State restrictions</li> <li>• Some of the competencies fall under dietetics program</li> <li>• Place in curriculum</li> <li>• There is disagreement over what should be included in the curriculum</li> <li>• Programming concerns within discipline</li> </ul>	<p><b>Subcategory 2: Hour restriction</b></p> <ul style="list-style-type: none"> <li>• Credit hour restriction</li> <li>• Hours allocated by the program</li> <li>• State restrictions</li> </ul> <p><b>Subcategory 3: Curriculum placement</b></p> <ul style="list-style-type: none"> <li>• Understanding needs of competencies</li> <li>• Current degree requirements</li> <li>• Some of the competencies fall under dietetics program</li> <li>• Place in curriculum</li> <li>• There is disagreement over what should be included in the curriculum</li> <li>• programming concerns within discipline</li> </ul>
<p><b>Importance -16</b></p> <ul style="list-style-type: none"> <li>• Don't think is important</li> <li>• Lack of importance to students</li> <li>• Lack of interest of students</li> <li>• Lack of motivation from participants since culinary arts is primary focus</li> <li>• Student Interest in topic</li> <li>• Interest</li> <li>• Student interest</li> <li>• Lack of student interest</li> <li>• Importance of nutrition compared to other competency skills such as cooking and restaurant operations</li> <li>• Student's level of interest</li> <li>• Importance of healthy preparation techniques</li> <li>• It isn't seen as necessary</li> <li>• Students don't think relates to field</li> <li>• Need buy in from all of faculty</li> <li>• Instructor buy in</li> <li>• Instructor commitment to teaching nutritional competencies</li> </ul>	<p><b>Importance –Subcategories</b></p> <p><b>Subcategory 1: Not important</b></p> <ul style="list-style-type: none"> <li>• Don't think is important</li> <li>• Lack of importance to students</li> <li>• Importance of healthy preparation techniques</li> <li>• It isn't seen as necessary</li> <li>• Students don't think it relates to field</li> <li>• Importance of nutrition compared to other competency skills such as cooking and restaurant operations</li> </ul> <p><b>Subcategory 2: Not interested</b></p> <ul style="list-style-type: none"> <li>• Lack of interest of students</li> <li>• Student interest in topic</li> <li>• Interest</li> <li>• Student interest</li> <li>• Lack of student interest</li> <li>• Student's level of interest</li> </ul> <p><b>Subcategory 3: Not Motivated</b></p> <ul style="list-style-type: none"> <li>• Lack of motivation from participants since culinary arts is primary focus</li> </ul>
<p><b>Time-11</b></p> <ul style="list-style-type: none"> <li>• Cooking fundamentals at times does not allow us</li> <li>• Not enough time in curriculum</li> <li>• Lack of time in curriculum</li> <li>• Lack of time with already loaded curriculum</li> <li>• Hours available in curriculum</li> <li>• Time within program</li> <li>• Time</li> <li>• Credit hour restriction</li> <li>• Part-time teaching load</li> <li>• Hours allocated by the secondary program competency of students</li> <li>• Lack of time is an already loaded curriculum</li> </ul>	<p><b>Time –Subcategories</b></p> <p><b>Subcategory 1: Not enough time</b></p> <ul style="list-style-type: none"> <li>• Cooking fundamentals at times does not allows us</li> <li>• Not enough time in curriculum</li> <li>• Lack of time in curriculum</li> <li>• Lack of time with already loaded curriculum</li> <li>• Time within program</li> <li>• Time</li> </ul> <p><b>Subcategory 2: Competing factors</b></p> <ul style="list-style-type: none"> <li>• Time required for other skill/competencies</li> </ul> <p><b>Subcategory 3: Hour Restriction</b></p> <ul style="list-style-type: none"> <li>• Credit hour restriction</li> </ul>



<ul style="list-style-type: none"> <li>• Time required for other skill/competencies</li> </ul>	<ul style="list-style-type: none"> <li>• Hours allocated by the program competency of students</li> <li>• Hours available in curriculum</li> <li>• Part-time teaching load</li> </ul>
<p><b>Tradition -7</b></p> <ul style="list-style-type: none"> <li>• Classics fat contribution to a recipe</li> <li>• Traditional high fat French technique</li> <li>• Traditional French Cuisine</li> <li>• Students may be resistant if they believe that making more nutritious food will compromise taste</li> <li>• Overcoming the concept of fine dining has to be high caloric and the word nutrition is no longer taboo</li> <li>• Establishing menus and recipes with nutritional emphasis</li> <li>• Future chefs not ready for such as active role in nutrition</li> </ul>	<p><b>Tradition Subcategories</b></p> <p><b>Subcategory 1: Classic techniques</b></p> <ul style="list-style-type: none"> <li>• Classics fat contribution to a recipe</li> <li>• Traditional high fat French technique</li> <li>• Traditional French cuisine</li> </ul> <p><b>Subcategory 2: Compromise taste</b></p> <ul style="list-style-type: none"> <li>• Students may be resistant if they believe that making more nutritious food will compromise taste</li> <li>• Establishing menus and recipes with nutritional emphasis</li> </ul> <p><b>Subcategory 3: Overcoming change</b></p> <ul style="list-style-type: none"> <li>• Overcoming the concept of fine dining has to be high caloric and the word nutrition is no longer taboo</li> <li>• Future chefs not ready for such as active role in nutrition</li> </ul>
<p><b>Influence-5</b></p> <ul style="list-style-type: none"> <li>• Laws too influenced by government</li> <li>• Regulation backed by big industry money that has its own self interest</li> <li>• Nutrition info changes too much based on those big interest groups and not on truth and fact</li> <li>• Constant change in nutritional information</li> <li>• Industry needs</li> </ul>	<p><b>Influence Subcategories</b></p> <p><b>Subcategory 1: Government</b></p> <ul style="list-style-type: none"> <li>• Laws too influenced by government</li> <li>• Constant change in nutritional information</li> </ul> <p><b>Subcategory 2: Big interest groups</b></p> <ul style="list-style-type: none"> <li>• Regulation backed by big industry money that has its own self interest</li> <li>• Industry needs</li> <li>• Nutrition info changes too much based on those big interest groups and not on truth</li> </ul>
<p><b>Resources-5</b></p> <ul style="list-style-type: none"> <li>• Financial resources</li> <li>• Resources</li> <li>• Not enough teachers to facilitate education</li> <li>• Facilities are not designed to teach nutritional competencies</li> <li>• Menu/nutrient analysis software</li> <li>• Access to information</li> </ul>	<p><b>Resources Subcategories</b></p> <p><b>Subcategory 1: Financial resources</b></p> <ul style="list-style-type: none"> <li>• Financial resources</li> <li>• Resources</li> </ul> <p><b>Subcategory 2: Support</b></p> <ul style="list-style-type: none"> <li>• Not enough teachers to facilitate education</li> <li>• Facilities are not designed to teach nutritional competencies</li> </ul> <p><b>Subcategory 3: Technology</b></p> <ul style="list-style-type: none"> <li>• Menu/nutrient analysis software</li> <li>• Access to information</li> </ul>
<p><b>Ability -2</b></p> <ul style="list-style-type: none"> <li>• Higher levels of competency skills that are required are above the standard student capability to absorb</li> <li>• Students ability to comprehend information</li> </ul>	

**(Appendix 8-Educators Coding Responses)**

Coding –Educators survey response to barriers to teaching nutritional competencies	
<p><b>Curriculum 37</b></p> <ul style="list-style-type: none"> <li>• The current curriculum does not integrate nutrition throughout the coursework</li> <li>• Nutrition is handled as a single course and those concepts are not then utilized in other work</li> <li>• Science background of students time in curriculum</li> <li>• Established curriculum</li> <li>• Combining lecture and lab hours in one class</li> <li>• Room/credit limits in curriculum</li> <li>• Nutrition education administered by biology departments for nursing and health; therefore the emphasis is on human use of nutrients not feeding</li> <li>• Hour limit for undergraduate degrees</li> <li>• Other competencies compete for curriculum space</li> <li>• Limited space in curriculum</li> <li>• Amount of credit hours a curriculum can have</li> <li>• Academic level of math and science required for advanced nutrition courses</li> <li>• Not enough credits remaining in curriculum to incorporate</li> <li>• Nutrition taught by a different academic unit</li> <li>• Space in curriculum</li> <li>• Viewed as a “hard science” so hospitality programs reluctant</li> <li>• Established curriculum does not emphasize nutrition</li> <li>• Credit limitations</li> <li>• Delivery methods</li> <li>• Degree plan limits on total hours</li> <li>• Time in the courses and curriculum</li> <li>• Curriculum requirements for the degree</li> <li>• Not in the curriculum</li> <li>• Limit on the hours students must take</li> <li>• Limited curriculum hours</li> <li>• Course requirements prohibit adding more classes to the current curriculum</li> <li>• Accreditation requirements</li> <li>• Not available curriculum mapping strategies</li> <li>• Lack of integration of nutritional instruction and opportunities for demonstrating competencies with culinary coursework</li> <li>• Too many details added into a 2 year culinary degree</li> <li>• Program requirements in general</li> <li>• If add additional content to course, something</li> </ul>	<p><b>Curriculum Subcategories</b></p> <p><b>Subcategory 1: Time</b></p> <ul style="list-style-type: none"> <li>• Science background of students time in curriculum</li> <li>• Time in the courses and curriculum</li> <li>• Time available in a two year curriculum</li> <li>• Time/credit hour limitations</li> </ul> <p><b>Subcategory 2: Hour restriction</b></p> <ul style="list-style-type: none"> <li>• Room/credit limits in curriculum</li> <li>• Hour limit for undergraduate degrees</li> <li>• Other competencies compete for curriculum space</li> <li>• Limited space in curriculum</li> <li>• Amount of credit hours a curriculum can have</li> <li>• Not enough credits remaining in curriculum to incorporate</li> <li>• Space in curriculum</li> <li>• Credit limitations</li> <li>• Degree plan limits on total hours</li> <li>• Limit on the hours students must take</li> <li>• Limited curriculum hours</li> <li>• Course requirements prohibit adding more classes to the current curriculum</li> </ul> <p><b>Subcategory 3: Curriculum design</b></p> <ul style="list-style-type: none"> <li>• The current curriculum does not integrate nutrition throughout the coursework</li> <li>• Nutrition is handled as a single course and those concepts are not then utilized in other work</li> <li>• Established curriculum</li> <li>• Combining lecture and lab hours in one class</li> <li>• Established curriculum does not emphasize nutrition</li> <li>• Curriculum requirements for the degree</li> <li>• Not in the curriculum</li> <li>• Accreditation requirements</li> <li>• Not available curriculum mapping strategies</li> <li>• Lack of integration of nutritional instruction and opportunities for demonstrating competencies with culinary coursework</li> <li>• Program requirements in general</li> <li>• Nutrition classes based in biology department, do not apply concepts to culinary arts</li> <li>• Curriculum objective</li> </ul> <p><b>Subcategory 4: Preparation</b></p> <ul style="list-style-type: none"> <li>• Academic level of math and science required for advanced nutrition courses</li> </ul>

<ul style="list-style-type: none"> <li>• else has to “go”</li> <li>• Curriculum and number of courses are already more than most community college majors have to take</li> <li>• Time available in a two year curriculum</li> <li>• Nutrition classes based in biology department, do not apply concepts to culinary arts</li> <li>• Biologists teaching culinarians</li> <li>• Curriculum objective</li> <li>• Time/credit hour limitations</li> <li>• Availability within the curriculum to add more nutrition courses</li> </ul>	<ul style="list-style-type: none"> <li>• Delivery methods</li> </ul> <p><b>Subcategory 5: Crowded Curriculum</b></p> <ul style="list-style-type: none"> <li>• If adding additional courses, then something else has to “go”</li> <li>• Too many details added into a 2 year culinary degree</li> <li>• Curriculum and number of courses are already more than most community college majors have to take</li> <li>• Availability within the curriculum to add more nutrition courses</li> </ul> <p><b>Subcategory 6: Hard Sciences</b></p> <ul style="list-style-type: none"> <li>• Viewed as a “hard science” so hospitality programs reluctant</li> <li>• Biologists teaching culinarians</li> <li>• Nutrition education administered by biology departments for nursing and health; therefore the emphasis is on human use of nutrients not feeding</li> <li>• Nutrition taught by a different academic unit</li> </ul>
<p><b>Knowledge-35</b></p> <ul style="list-style-type: none"> <li>• Lack of skill in teaching the competencies</li> <li>• Instructors who are experienced in such</li> <li>• Many of the lab courses are taught by chef that have no nutritional training as well</li> <li>• Knowledge of culinary instructors</li> <li>• Continuing education for faculty/staff</li> <li>• RD instructors that have little or no knowledge of culinary techniques</li> <li>• Disconnect between preparation of food and nutritional effect</li> <li>• Finding qualified MS RD’s to teach the courses</li> <li>• Qualified instructors</li> <li>• Faculty lack expertise in nutrition</li> <li>• Not enough skilled faculty members</li> <li>• Instructor knowledge</li> <li>• Lack of knowledge about the subject</li> <li>• Knowledge of instructors about nutrition</li> <li>• Lack of qualified nutrition instructors</li> <li>• Knowledge &amp; skill of culinary faculty</li> <li>• Faculty knowledge</li> <li>• Faculty expertise</li> <li>• Instructor lacking appropriate background</li> <li>• Instructor knowledge</li> <li>• Lack of appropriately credentialed instructional staff (RD, RDN)</li> <li>• Need to educate instructors how to incorporate nutrition into classes</li> <li>• Lack of expertise in the subject</li> <li>• Lack of qualified RDs on staff</li> <li>• Insufficient pool of chefs with nutritional cooking experience</li> <li>• Faculty knowledge of topic</li> </ul>	<p><b>Knowledge Subcategories</b></p> <p><b>Subcategory 1: Lack of Knowledge</b></p> <ul style="list-style-type: none"> <li>• Knowledge of culinary instructors</li> <li>• Continuing education for faculty/staff</li> <li>• RD instructors that have little or no knowledge of culinary techniques</li> <li>• Faculty lack expertise in nutrition</li> <li>• Instructor knowledge</li> <li>• Lack of knowledge about the subject</li> <li>• Knowledge of instructors about nutrition</li> <li>• Knowledge &amp; skill of culinary faculty</li> <li>• Faculty knowledge</li> <li>• Faculty expertise</li> <li>• Instructor knowledge</li> <li>• Faculty knowledge of topic</li> <li>• Basic nutrition knowledge of instructors</li> <li>• Faculty expertise</li> <li>• Lack of subject matter expertise</li> <li>• There is no base line understanding of nutrition by the culinary population</li> </ul> <p><b>Subcategory 2: Skills to teach</b></p> <ul style="list-style-type: none"> <li>• Lack of skill in teaching the competencies</li> <li>• Not enough skilled faculty members</li> <li>• Knowledge &amp; skill of culinary faculty</li> <li>• Insufficient pool of chefs with nutritional cooking experience</li> <li>• Lack of instructional expertise</li> <li>• No experience cooking healthy</li> <li>• No personal experience with nutrition</li> </ul> <p><b>Qualifications</b> Subcategory 3</p>

<ul style="list-style-type: none"> <li>• Basic nutrition knowledge of instructors</li> <li>• Lack of instructional expertise</li> <li>• Lack of nutritional knowledge</li> <li>• No experience cooking healthy</li> <li>• No personal experience with nutrition</li> <li>• Faculty expertise</li> <li>• Lack of subject matter expertise</li> <li>• There is no base line understanding of nutrition by the culinary population</li> <li>• Dietitians do not relate well to culinary and hospitality students</li> </ul>	<ul style="list-style-type: none"> <li>• Instructors who are experience in such</li> <li>• Finding qualified MS RD's to teach the courses</li> <li>• Qualified instructors</li> <li>• Lack of qualified nutrition instructors</li> <li>• Instructor lacking appropriate background</li> <li>• Lack of appropriately credentialed instructional staff (RD, RDN)</li> </ul> <p><b>Subcategory 5 : Experience</b></p> <ul style="list-style-type: none"> <li>• Instructors who are experience in such</li> <li>• RD instructors that have little or no knowledge of culinary techniques</li> <li>• Disconnect between preparation of food and nutritional effect</li> <li>• Disconnect between preparation of food and nutritional effect</li> <li>• Dietitians do not relate well to culinary and hospitality students</li> </ul>
<p><b>Resources-24</b></p> <ul style="list-style-type: none"> <li>• Money for wholesome ingredients</li> <li>• Status quo cost of technologies</li> <li>• Continuing education for faculty/staff</li> <li>• Funding for technology</li> <li>• Prices of specialty items, fresh produce, etc</li> <li>• Lab facilities</li> <li>• Budget constraints in purchasing products for labs</li> <li>• Lack of resources</li> <li>• Relevant materials</li> <li>• Cost</li> <li>• Lack of engaging instructional materials</li> <li>• Resources</li> <li>• Lack of “interesting” learning materials</li> <li>• Lack of continuing education opportunities</li> <li>• Department resources</li> <li>• Funding</li> <li>• Using registered dietitians only to teach</li> <li>• The family system or lack of family system as the student is raised</li> <li>• Quality textbooks</li> <li>• Lack of qualified RDs on staff</li> <li>• Quality textbooks</li> <li>• Only one faculty member has training in this area</li> <li>• Cost developing curriculum</li> <li>• Lack of funding to hire educated nutrition faculty</li> <li>• Lab space</li> <li>• Software programs</li> </ul>	<p><b>Resources Subcategories</b></p> <p><b>Subcategory 1: Financial</b></p> <ul style="list-style-type: none"> <li>• Lack of resources</li> <li>• Cost</li> <li>• Department resources</li> <li>• Funding</li> </ul> <p><b>Subcategory 2: Technology</b></p> <ul style="list-style-type: none"> <li>• Status quo cost of technologies</li> <li>• Funding for technology</li> <li>• Software programs</li> </ul> <p><b>Subcategory 3: Healthy Food Supplies</b></p> <ul style="list-style-type: none"> <li>• Money for wholesome ingredients</li> <li>• Prices of specialty items, fresh produce, etc</li> <li>• Budget constraints in purchasing products for labs</li> <li>• Resources</li> </ul> <p><b>Subcategory 4: Continuing Education</b></p> <ul style="list-style-type: none"> <li>• Continuing education for faculty/staff</li> <li>• Lack of continuing education opportunities</li> </ul> <p><b>Subcategory 5: Teaching Materials</b></p> <ul style="list-style-type: none"> <li>• Relevant materials</li> <li>• Lack of engaging instructional materials</li> <li>• Lack of “interesting” learning materials</li> <li>• Quality textbooks</li> <li>• Cost developing curriculum</li> <li>• Simplification of nutrition texts to make students feel that they can better master more of the theories and the entire culinary /nutrition concept</li> </ul> <p><b>Subcategory 6: Faculty</b></p>

	<ul style="list-style-type: none"> <li>• Lack of funding to hire educated nutrition faculty</li> <li>• Only one faculty member has training in this area</li> <li>• Lack of qualified RDs on staff</li> <li>• Using registered dietitians only to teach</li> </ul> <p><b>Subcategory 7: Facilities</b></p> <ul style="list-style-type: none"> <li>• Lab space</li> <li>• Lab facilities</li> </ul>
<p><b>Time-24</b></p> <ul style="list-style-type: none"> <li>• Time</li> <li>• Time-there never seems to be enough time to address everything we think is important</li> <li>• Room/credit limits in curriculum</li> <li>• Hour limit for undergraduate degrees</li> <li>• Time curriculum restraints</li> <li>• Time in a 2 year program</li> <li>• Limited space in the curriculum</li> <li>• Time allowable in the current classes to be able to thoroughly teach the competencies</li> <li>• Space in curriculum</li> <li>• Time constraints</li> <li>• Time</li> <li>• Lack of lab time to explore recipe modification attempts</li> <li>• Degree plan limits on total hours</li> <li>• Time</li> <li>• Limit on the hours students must take</li> <li>• Time in the courses and curriculum</li> <li>• Limited curriculum hours</li> <li>• Competition for time with teaching of culinary techniques</li> <li>• Time is limited when teaching culinary</li> <li>• The amount of time needed to add more competencies</li> <li>• Time constraints</li> <li>• Classroom time vs. lab time</li> <li>• Time available for two year curriculum</li> <li>• Time/credit hour limitations</li> </ul>	<p><b>Time- Subcategories</b></p> <p><b>Subcategory 1 :Not enough time</b></p> <ul style="list-style-type: none"> <li>• Time</li> <li>• Time-there never seems to be enough time to address everything we think is important</li> <li>• Time curriculum restraints</li> <li>• Time in a 2 year program</li> <li>• Time allowable in the current classes to be able to thoroughly teach the competencies</li> <li>• Time constraints</li> <li>• Time</li> <li>• Lack of lab time to explore recipe modification attempts</li> <li>• Time in the courses and curriculum</li> <li>• Time</li> <li>• Time is limited when teaching culinary</li> <li>• Time constraints</li> <li>• Classroom time vs. lab time</li> <li>• Time available for two year curriculum</li> <li>• Time/credit hour limitations</li> </ul> <p><b>Subcategory 2: Competing factors</b></p> <ul style="list-style-type: none"> <li>• Room/credit limits in curriculum</li> <li>• Hour limit for undergraduate degrees</li> <li>• Limited space in the curriculum</li> <li>• Space in curriculum</li> <li>• Degree plan limits on total hours</li> <li>• Limited curriculum hours</li> <li>• Competition for time with teaching of culinary techniques</li> <li>• The amount of time needed to add more competencies</li> <li>• Classroom time vs. lab time</li> </ul> <p><b>Subcategory 3 :Hour Restriction</b></p> <ul style="list-style-type: none"> <li>• Limit on the hours students must take</li> <li>• Limited curriculum hours</li> </ul>
<p><b>Commitment-14</b></p> <ul style="list-style-type: none"> <li>• Instructor resistance</li> <li>• Many chefs are not on board with healthy menu options</li> </ul>	<p><b>Commitment Categories</b></p> <p><b>Subcategory 1: Buy in</b></p> <ul style="list-style-type: none"> <li>• Many chefs are not on board with healthy menu options</li> <li>• Instructors that are excited rock nutritional</li> </ul>

<ul style="list-style-type: none"> <li>• Lack of interest leads to little personal research in the area of nutrition</li> <li>• Instructors that are excited rock nutritional competencies throughout classes taught</li> <li>• Attitudes of existing faculty toward nutrition and/or healthy cooking methods</li> <li>• Competing academic priorities</li> <li>• Lack of dialogue between and among related fields (chemistry, sports science, etc)</li> <li>• Interest of culinary faculty</li> <li>• Dietitians do not take teaching culinary and hospitality as seriously as they do students in their own discipline</li> <li>• Culinary instructors do not stress nutrition in the laboratory curriculum</li> <li>• The instructor feeling like they cannot teach as an expert because they are overweight</li> <li>• Hospitality more focused on operations not nutrition</li> <li>• Industry partners indicate little interest when helping to design/update culinary curriculum</li> <li>• Community is not strongly in favor of this</li> </ul>	<p>competencies throughout classes taught</p> <ul style="list-style-type: none"> <li>• Interest of culinary faculty</li> <li>• Dietitians do not take teaching culinary and hospitality as seriously as they do students in their own discipline</li> <li>• Hospitality more focused on operations not nutrition</li> <li>• Industry partners indicate little interest when helping to design/update culinary curriculum</li> <li>• Community is not strongly in favor of this</li> </ul> <p><b>Subcategory 2: Resistance</b></p> <ul style="list-style-type: none"> <li>• Instructor resistance</li> <li>• The instructor feeling like they cannot teach as an expert because they are overweight</li> </ul> <p><b>Subcategory 3: Don't see value</b></p> <ul style="list-style-type: none"> <li>• Lack of interest leads to little personal research in the area of nutrition</li> <li>• Competing academic priorities</li> <li>• Culinary instructors do not stress nutrition in the laboratory curriculum</li> </ul> <p><b>Subcategory 4: Communication</b></p> <ul style="list-style-type: none"> <li>• Lack of dialogue between and among related fields (chemistry, sports science, etc)</li> </ul>
<p><b>Influence-11</b></p> <ul style="list-style-type: none"> <li>• What the media is covering changes daily</li> <li>• Trends</li> <li>• Industry demands</li> <li>• Customer driven demand</li> <li>• Government regulations about obesity</li> <li>• Myths surrounding good nutrition</li> <li>• Lack of consistent information from research</li> <li>• Governmental and Association guidelines seem one-sided and it seems to dissuade critical thinking</li> <li>• Industry demands</li> <li>• Government regulations rewriting the curriculum</li> <li>• As consumers we say we want healthy but our actions do not support that</li> </ul>	<p><b>Influence Subcategories</b></p> <p><b>Subcategory 1: Government</b></p> <ul style="list-style-type: none"> <li>• Government regulations about obesity</li> <li>• Governmental and Association guidelines seem one-sided and it seems to dissuade critical thinking</li> <li>• Government regulations rewriting the curriculum</li> </ul> <p><b>Subcategory 2: Consumer Demand</b></p> <ul style="list-style-type: none"> <li>• Customer driven demand</li> <li>• As consumers we say we want healthy but our actions do not support that</li> </ul> <p><b>Subcategory 3: Industry</b></p> <ul style="list-style-type: none"> <li>• Industry demands</li> <li>• Lack of consistent information from research</li> </ul> <p><b>Subcategory 4: Trends</b></p> <ul style="list-style-type: none"> <li>• What the media is covering changes daily</li> <li>• Trends</li> <li>• Myths surrounding good nutrition</li> <li>• As consumers we say we want healthy but our actions do not support that</li> </ul>

<p><b>Tradition -7</b></p> <ul style="list-style-type: none"> <li>• Chef instructors favor classical methods of food prep</li> <li>• French cuisine is not a heart-healthy cuisine</li> <li>• Cultural restrictions</li> <li>• Dietitians do not relate well to culinary and hospitality students</li> <li>• The student's belief system</li> <li>• Using traditional cooking method in operations</li> </ul>	<p><b>Tradition Subcategories</b></p> <p><b>Subcategory 1: Classic Techniques</b></p> <ul style="list-style-type: none"> <li>• Chef instructors favor classical methods of food prep</li> <li>• Using traditional cooking method in operations</li> <li>• French cuisine is not a heart-healthy</li> </ul> <p><b>Subcategory 2: Beliefs</b></p> <ul style="list-style-type: none"> <li>• Cultural restrictions</li> <li>• The student's belief system</li> <li>• Dietitians do not relate well to culinary and hospitality students</li> </ul>
<p><b>Ability-7</b></p> <ul style="list-style-type: none"> <li>• Science background of students time in curriculum</li> <li>• Student intelligence</li> <li>• Academic level of math and science required for advanced nutrition courses</li> <li>• Students are not prepared to learn the material</li> <li>• The preparedness of the high school student when they enter college</li> <li>• Culinary students are very under prepared for learning nutrition science concepts</li> </ul>	<p><b>Ability Subcategories</b></p> <p><b>Subcategory 1: Student Background</b></p> <ul style="list-style-type: none"> <li>• Science background of students time in curriculum</li> <li>• Academic level of math and science required for advanced nutrition courses</li> </ul> <p><b>Subcategory 2: Level of Preparedness</b></p> <ul style="list-style-type: none"> <li>• Students are not prepared to learn the material</li> <li>• The preparedness of the high school student when they enter college</li> <li>• Culinary students are very under prepared for learning nutrition science concepts</li> </ul>

**(Appendix 9- Delphi Coding Nutritional Position Statement Responses)**

Question: Compose what you believe would make a nutritional position statement related to the needed level of nutritional competency in post-secondary culinary curriculum.	
Coding Delphi nutrition position statement	
<p><b>Students</b></p> <ul style="list-style-type: none"> <li>• Should demonstrate a complete understanding of nutrition</li> <li>• Demonstrated strong foundation of nutrition understanding</li> <li>• Prepare for the current and emerging nutritional issues they will encounter in their future careers</li> <li>• Providing tools for them to meet needs of the dining public</li> <li>• Students enrolled in post-secondary curriculums in hospitality management and culinary educations have a responsibility to be knowledgeable with regard to the dietary guideline</li> <li>• Understand how to provide service and meals in keeping with nutritional standards of practice</li> <li>• Students will understand the importance of sound nutrition to overall well-being of the guest/customer</li> <li>• Incorporate accurate nutritional practices in the preparation, service, and marketing of menu items to clients</li> <li>• Students should master the basics of nutritional science</li> <li>• Practice the application of nutritional approaches in the preparation of all dishes and baked goods</li> <li>• Effectively equipping post-secondary culinary students with the knowledge and skills necessary to create, analyze, and market healthier food.</li> <li>• For culinary students, nutrition education provides a self-improvement and the relationship of nutrients to food sources</li> <li>• Students can demonstrate and prepare optimal products that meet the nutritional needs of the population throughout the lifecycle</li> <li>• Culinary students need to obtain nutritional competencies to the extent at which they can fully understand dietary principles as they related to medical nutrition therapies in order to service the public</li> <li>• Understand the need for culinarians to be able to work in all parts of food service and believe that a basic knowledge of concepts is worthy of learning</li> </ul>	<p><b>Student Subcategories</b></p> <p><b>Subcategory 1: Demonstrate Understanding</b></p> <ul style="list-style-type: none"> <li>• Should demonstrate a complete understanding nutrition</li> <li>• Demonstrate strong foundation of nutrition understanding</li> <li>• Students will understand the importance of sound nutrition to overall well-being of the guest/customer</li> <li>• Students should master the basics of nutritional science</li> <li>• Practice the application of nutritional approaches in the preparation of all dishes and baked goods</li> <li>• For culinary students, nutrition education provides a self-improvement and the relationship of nutrients to food sources</li> <li>• Understand the need for culinarians to be able to work in all parts of food service and believe that a basic knowledge of concepts is worthy of learning</li> </ul> <p><b>Subcategory 2: Prepared for emerging issues</b></p> <ul style="list-style-type: none"> <li>• Prepare for the current and emerging nutritional issues they will encounter in their future careers</li> <li>• Providing tools for them to meet needs of the dining public</li> <li>• Understand how to provide service and meals in keeping with nutritional standards of practice</li> <li>• Incorporate accurate nutritional practices in the preparation, service, and marketing of menu items to clients</li> <li>• Effectively equipping post-secondary culinary students with the knowledge and skills necessary to create, analyze, and market healthier food.</li> <li>• Culinary students need to obtain nutritional competencies to the extent at which they can fully understand dietary principles as they related to medical nutrition therapies in order to service the public</li> </ul> <p><b>Subcategories 3; Responsibility</b></p> <ul style="list-style-type: none"> <li>• Students enrolled in post-secondary curriculums in hospitality management and culinary educations have a responsibility to be knowledgeable with regard to the dietary guideline and how to provide service and meals</li> </ul>



	<p>in keeping with these standards of practice</p> <ul style="list-style-type: none"> <li>• Students can demonstrate and prepare optimal products that meet the nutritional needs of the population throughout the lifecycle</li> <li>•</li> </ul>
<p><b>Chefs</b></p> <ul style="list-style-type: none"> <li>• Need to be well versed</li> <li>• Not experts</li> <li>• Good foundation and skills to identify, create menus and execute the preparation of food</li> <li>• Have the knowledge to accurately prepare foods according to a variety of customer preferences</li> <li>• Culinary professionals have a significant role and responsibility to fully understand dietary principles in order to service the public in such a way as to become a trusted source for serving food that meets the customer’s nutritional need</li> <li>• One of the first steps to improving health is educating yourself in nutrition</li> </ul>	<p><b>Chefs Subcategories</b></p> <p><b>Subcategory 1: Well Versed</b></p> <ul style="list-style-type: none"> <li>• Need to be well versed</li> <li>• Good foundation and skills to identify, create menus and execute the preparation of food</li> <li>• Have the knowledge to accurately prepare foods according to a variety of customer preferences</li> </ul> <p><b>Subcategory 2: Not Experts</b></p> <ul style="list-style-type: none"> <li>• Not experts</li> </ul> <p><b>Subcategory 3: Responsibility</b></p> <ul style="list-style-type: none"> <li>• Culinary professionals have a significant role and responsibility to fully understand dietary principles in order to service the public in such a way as to become a trusted source for serving food that meets the customer’s nutritional need</li> <li>• One of the first steps to improving health is educating yourself in nutrition</li> </ul>
<p><b>Nutrition</b></p> <ul style="list-style-type: none"> <li>• Subject should hold equal or more importance</li> <li>• Woven throughout the lecture and lab contact for all culinary arts and baking pastry</li> <li>• Human nutrition has been proven to correlate with overall health and longevity in the population of the United States</li> <li>• Understanding how food nourishes our bodies we can incorporated food choices accordingly</li> <li>• Nutrition education is no longer a vague or unappetizing topic</li> <li>• Nutrition education is a rapidly growing integral part of our food choices and our culture</li> <li>• Committed to nutritional education as an integral part of our culinary program</li> <li>• Demand in order to be marketable to the jobs market</li> <li>• There should be a considerable amount of time spent on ways to cook for healthfully, nutrition of foods and ways to cook for alternative food lifestyles-vegetarian, gluten free, vegan</li> <li>• It is important to have a strong nutritional competency</li> <li>• Nutritional competency is something that is very big in the industry today</li> </ul>	<p><b>Nutrition Subcategories</b></p> <p><b>Subcategory 1: Importance</b></p> <ul style="list-style-type: none"> <li>• Subject should hold equal or more importance</li> <li>• Human nutrition has been proven to correlate with overall health and longevity in the population of the United States</li> <li>• Understanding how food nourishes our bodies we can incorporated food choices accordingly</li> <li>• Demand in order to be marketable to the jobs market</li> </ul> <p><b>Subcategory 2: Integration</b></p> <ul style="list-style-type: none"> <li>• Woven throughout the lecture and lab contact for all culinary arts and baking pastry</li> <li>• Committed to nutritional education as an integral part of our culinary program There should be a considerable amount of time spent on ways to cook for healthfully, nutrition of foods and ways to cook for alternative food lifestyles-vegetarian, gluten free, vegan</li> </ul> <p><b>Subcategory 3: Philosophy</b></p> <ul style="list-style-type: none"> <li>• Nutrition education is a rapidly growing integral part of our food choices and our culture</li> </ul>

<ul style="list-style-type: none"> <li>• Post-secondary curriculum and their competencies must meet this growing demand in order to be marketable to the jobs market and provide the foods necessary to keep the general public healthy</li> </ul>	<ul style="list-style-type: none"> <li>• Nutrition education is no longer a vague or unappetizing topic</li> </ul> <p><b>Subcategory 4: Curriculum</b></p> <ul style="list-style-type: none"> <li>• It is important to have a strong nutritional competency</li> <li>• Nutritional competency is something that is very big in the industry today</li> <li>• Post-secondary curriculum and their competencies must meet this growing demand in order to be marketable to the jobs market and provide the foods necessary to keep the general public healthy</li> </ul>
<p><b>Community</b></p> <ul style="list-style-type: none"> <li>• Provide the foods necessary to keep the general public healthy</li> <li>• Our program strives to improve the health of American through food</li> <li>• Healthy cuisine has become a trend within the food industry relating back to the simple concepts of healthy preparation of whole foods as well as alternate food sources for allergy and diet restricted customers</li> <li>• Good nutrition is vital to health and quality of life throughout the lifespan</li> <li>• We strive to have balance of classical and basic cooking fundamentals while keeping with the nutritional needs of our consumers</li> <li>• We strive to provide whole foods, grains and will proactively guide you through key nutritional information while limiting access to process foods which will in turn allow our customers to stay focused and live longer healthier productive lives</li> <li>• Become trusted source for serving food that meets the customer’s nutritional need.</li> </ul>	<p><b>Community Subcategories</b></p> <p><b>Subcategory 1: Goals</b></p> <ul style="list-style-type: none"> <li>• Healthy cuisine has become a trend within the food industry relating back to the simple concepts of healthy preparation of whole foods as well as alternate food sources for allergy and diet restricted customers</li> <li>• Good nutrition is vital to health and quality of life throughout the lifespan</li> <li>• Become trusted source for serving food that meets the customer’s nutritional need.</li> </ul> <p><b>Subcategory 2: Consumers</b></p> <ul style="list-style-type: none"> <li>• Provide the foods necessary to keep the general public healthy</li> <li>• Our program strives to improve the health of American through food</li> <li>• We strive to have balance of classical and basic cooking fundamentals while keeping with the nutritional needs of our consumers</li> <li>• We strive to provide whole foods, grains and will proactively guide you through key nutritional information while limiting access to process foods which will in turn allow our customers to stay focused and live longer healthier productive lives</li> </ul>

## (Appendix 10- Survey Instrument)

### Survey Overview

This survey consists of 23 questions; 7 demographic questions and 16 nutritional content questions, and should take 10-15 minutes to complete. Please answer questions to the best of your ability. Nutrition competencies referred to in this survey are based on American Culinary Federation Educational Foundation (AFCEF) accrediting standards. Currently the majority of accredited programs are required to offer a minimum of one nutrition course as part of the curriculum. The goal of this study is to determine if current levels of nutritional instruction is sufficient in the current environment of rising obesity and health related concerns. The findings of this study will provide both academic and culinary industry stakeholders a foundation for better understanding in how nutrition content fits into overall curriculum design, what barriers exist to teaching nutritional concepts in post-secondary culinary curriculum and how well it is currently being achieved. Thank you for your time and knowledge in this important area of research.

**1. Which of the following best represent your employment position.**

- Academic/College/Teaching with 5 years or more restaurant industry experience
- Academic/College/Teaching
- Nutritionist/Dietitian/College/Teaching
- Nutritionist/Dietitian/Community Education
- Industry Representative

Other (please specify)

**2. How long have you been in your current professional career?**

- 0-5
- 6-10
- 11-15
- 16-20
- 21 + years

**3. Please specify your highest educational level.**

- Associate's Degree
- Bachelor's Degree
- Master's Degree
- Doctoral Degree

Other (please specify)

**4. What is your gender?**

- Female
- Male

**5. What is your age?**

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 to 74
- 75 or older

**6. What type of culinary/hospitality program best describes your program?**

- Four-year hospitality, Two-year culinary program
- Four-year hospitality program, Four-year culinary program
- Four-year hospitality management program
- Two-year hospitality management program
- Four-year culinary program
- Two-year culinary program
- Not affiliated with a hospitality/culinary program

Other (please specify)

**7. Please select which organization(s) best represents your professional affiliation.**

- ICHRIE
- American Culinary Federation Educational Foundation
- ICHRIE and the American Culinary Federation Educational Foundation

Other (please specify)

**8. Are you responsible for post-secondary culinary curriculum development?**

- Yes
- No

**9. To what extent do you think nutritional concepts should be included in post-secondary curriculum?**

- One nutrition course
- Two nutrition courses
- More than two nutrition courses
- Nutrition offered as elective
- Nutrition is integrated into a number of courses
- Nutrition course offered and integrated throughout the curriculum
- No coverage of nutrition course or topic

Other (please specify)

**10. Please select the choice that indicates the level of importance, you think should be given to each competency statements for the knowledge area: nutrition (how important is the competency to the students knowledge base).**

	No Importance	Limited Importance	Moderate Importance	Considerable Importance	Essential
Identify current USDA My Plate principles and food groups.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
List the nutrient contributions of each food group.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss the nine areas where dietary guidelines make recommendations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Develop recipes and menus using dietary guidelines recommendations, food guides and food labels.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluate recipes and menus using dietary guideline recommendations, food guides and food labels.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss characteristics, functions and best sources of each of the major nutrients.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Describe the process of human digestion.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determine energy needs based upon basal metabolic rate and exercise expenditure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss and demonstrate cooking techniques and storage principles and portion sizes for maximum retention of nutrients and effective weight management.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss exchange group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Identify common food allergies and determine appropriate substitutions. (i.e. gluten, sugar, lactose free)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss contemporary nutritional issues (i.e. vegetarianism, heart healthy menus and religious dietary laws).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply emerging technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(computerization) for  
nutrient analysis (i.e.  
Internet, recipe analysis  
laws).

Discuss marketing of  
healthy menu options.

Discuss weight  
management and exercise  
and nutrition over the life  
cycle.

**11. Post-secondary culinary graduates are prepared in their curriculum to meet contemporary nutritional issues facing society today?**

Strongly Disagree

Disagree

Neither Agree or Disagree

Agree

Strongly Agree



**12. To what extent in your program are the following nutritional competencies being taught in post-secondary culinary curriculum? (taught to the level that students should have achieved working knowledge of competencies)**

	Never	Rarely	Sometimes	Very Often	Always
Identify current USDA My Plate principles and food groups.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
List the nutrient contributions of each food group.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss the nine areas where dietary guideline make recommendations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Develop recipes and menus using dietary guidelines recommendations, food guides and food labels.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluate recipes and menus using dietary guideline recommendations, food guides and food labels.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss characteristics, functions and best sources of each of the major nutrients.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Describe the process of human digestion.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determine energy needs based upon basal metabolic rate and exercise expenditure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss and demonstrate cooking techniques and storage principles and portion sizes for maximum retention of nutrients and effective weight management.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss exchange groups.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Identify common food allergies and determine appropriate substitutions. (i.e. gluten, sugar, lactose free)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss contemporary nutritional issues (i.e. vegetarianism, heart healthy menus and religious dietary laws).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply emerging technologies (computerization) for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

nutrient analysis (i.e.  
Internet, recipe analysis  
laws):

Discuss marketing of  
healthy menu options.

Discuss weight  
management and exercise  
and nutrition over the life  
cycle

**13. The foodservice industry should have a proactive role in fighting the rising obesity and health related problems facing society today?**

Strongly Disagree  Disagree  Neither Agree or Disagree  Agree  Strongly Agree

**14. Consumers today are seeking healthier food selections when dining out.**

Strongly Disagree  Disagree  Neither Agree or Disagree  Agree  Strongly Agree

**15. Culinary/hospitality educators need to take a more proactive role in educating future chef/foodservice personnel to be knowledgeable in nutritional concepts that prepare students to offer healthier foods on the menus.**

Strongly Disagree  Disagree  Neither Agree or Disagree  Agree  Strongly Agree

**16. Culinary/hospitality educators are trained adequately in nutritional related concepts related to the rising obesity and health problems facing society today.**

Strongly Disagree  Disagree  Neither Agree or Disagree  Agree  Strongly Agree

**17. Government policies should encourage the foodservice industry to offer more healthier foods on the menu.**

Strongly Disagree  Disagree  Neither Agree or Disagree  Agree  Strongly Agree

**18. Nutritional competencies should be a priority when designing post-secondary culinary curriculum?**

Strongly Disagree  Disagree  Neither Disagree or Agree  Agree  Strongly Agree

**19. To what degree should the following nutritional competencies be integrated into (throughout) post-secondary culinary curriculum? (beyond the required nutrition course that most accredited post-secondary culinary programs are required to offer)**

	Never	Rarely	Sometimes	Very often	Always
Identify current USDA My Plate principles and food groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
List the nutrient contributions of each food group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss the nine areas where dietary guideline make recommendations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Develop recipes and menus using dietary guideline recommendations, food guides and food labels.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluate recipes and menus using dietary guideline recommendations, food guides and food labels.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss characteristics, functions and best sources of each of the major nutrients.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Describe the process of human digestion.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determine energy needs based upon basal metabolic rate and exercise expenditure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss and demonstrate cooking techniques and storage principles and portion sizes for maximum retention of nutrients and effective weight management.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss exchange group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Identify common food allergies and determine appropriate substitutions. (i.e. gluten, sugar, lactose free)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss contemporary nutritional issues (i.e. vegetarianism, heart healthy menus and religious dietary laws).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply emerging technologies (computerization) for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

nutrient analysis (i.e. Internet, recipe analysis laws).

Discuss marketing of healthy menu options.

Discuss weight management and exercise and nutrition over the life cycle.

**20. A number of barriers exist that prohibits teaching nutritional competencies in post-secondary curriculum.**

Strongly Disagree

Disagree

Neither Disagree or Agree

Agree

Strongly Agree

**21. Please list three possible barriers to teaching nutritional competencies in post-secondary curriculum in the order of being most problematic.**

**22. Should culinary/hospitality programs have a defined position statement on nutrition and its role in the post-secondary curriculum?**

Yes

No

**23. If the integration of nutrition curriculum increased the effectiveness of nutritional competencies of post-secondary culinary students this could affect consumer dining behavior, and hence reduce obesity.**

Strongly Disagree

Disagree

Neither Disagree or Agree

Agree

Strongly Agree

## **(Appendix 11 –Delphi Comment-Response to Survey Questions)**

### **Responses to 2<sup>nd</sup> round Delphi survey**

#### **Question 9-Post-secondary culinary graduates are prepared in their curriculum to meet contemporary nutritional issues facing society today.**

I think they are currently not adequately prepared. Nutrition should be integrated throughout curriculum. Repetition of these core principles will raise the level of awareness in graduates.

9/1/2013 8:46 PM

Believe more emphasis should be placed on how to modify menu items for fat, sodium and calories.

8/30/2013 8:09 PM

#### **Question 10-The foodservice industry should have a proactive role in fighting the rising obesity health related problems facing society today?**

If the foodservice industry does not, someone else will, and they may not have the skills or ability to do so effectively.

#### **Question 11-Consumers today are seeking healthier food selections when dining out.**

Research shows that many are not; higher socioeconomic groups tend to be seeking.

8/31/2013 11:31 AM

It seems that way, but when it comes to their actual purchases, it seems like they choose what they like, and not necessarily what is best for them from a nutritional standpoint.

8/30/2013 8:09 PM

#### **Question 14-Government policies should encourage the foodservice industry to offer healthier foods on the menu.**

I think the general population responds very negatively to governmental intervention.

9/1/2013 8:46 PM

Encourage is the key word. Maybe with incentives, not force.

8/31/2013 11:31 AM

Believe it is best for government to stay out of it, but it won't. Practitioners MUST get involved early and stay involved in the process.

8/30/2013 8:09 PM

#### **Question 15- Please select the choice that indicates the level of importance of each competency statement for knowledge area: nutrition (how important is the competency to the student's knowledge base).**

Culinary students should know the relative information about special diets as they apply to food being served, not necessarily the details but may need basic information about those special diets so background may be necessary to get to end result. Some services could be hired out, such as computer technologies.

8/31/2013 11:31 AM

**Responses for Question number 20-Please list three possible barriers to teaching nutritional competencies in post-secondary curriculum in the order of being most problematic.**

1. Students possibly don't think nutrition relates to their field or that it is important. 2. Some of the competencies fall under a dietetics program. 3. Future chefs may not be ready to take such an active nutritional role in the foodservice industry.

9/6/2013 4:05 PM

Cooking fundamentals at times does not allow us - classics Fat contribution to a recipe

9/6/2013 9:29 AM

Not enough time in curriculum Lack of importance to students Lack of knowledge on instructor's part

9/3/2013 8:18 PM

Skills to teach, understanding needs of competencies, establishing menus and recipes with nutritional emphasis.

9/2/2013 10:38 PM

Instructor knowledge dept coordination and consistency need buy in from all faculties

9/2/2013 12:16 PM

Current degree requirements qualified nutrition educators Menu/ nutrient analysis software

9/1/2013 8:46 PM

Food allergies, state restrictions, access to information

9/1/2013 8:27 PM

Lack of knowledge of instructors Lack of interest of students Lack of time in the curriculum

8/31/2013 12:15 PM

Lack of nutrition education thus far with current instructors Lack of time with an already loaded curriculum Lack of motivation for participants since culinary arts is primary focus

8/31/2013 11:31 AM

Hours available in curriculum finding qualified instructors student interest in topic common core of nutrition knowledge which should be included in all programs

8/30/2013 8:09 PM

Time within program. Laws too influenced by government regulation backed by big industry money that has its own self interest. Nutrition info changes too much based on those big interest groups and not on truth and fact.

8/30/2013 7:13 PM

Time, financial resources and interest

8/30/2013 7:04 PM

Credit hour restrictions student interest industry needs

8/29/2013 1:22 PM

Lack of Student Interest Importance of nutrition compared to other competency skills such as cooking and restaurant operations. Higher levels of competency skills that are required are above the standard student capability to absorb.

8/28/2013 4:06 PM

\* Past experiences in the preparation of food service recipes. \* Overcoming the concept of fine dining has to be high caloric and that the word nutrition is no longer taboo. \* The training of the instructor to best relate the nutritional competencies to the student.

8/28/2013 10:51 AM

Inadequate nutrition knowledge of faculty: traditional high fat French technique

8/28/2013 10:30 AM

Part-time teaching load real or perceive gap between chefs and dietitians/nutritionists

8/19/2013 9:55 PM

Instructor buy in, student's level of interest; knowledge level of instructor

8/19/2013 11:09 AM

Students may be resistant if they believe that making more nutritious food will compromise taste

8/16/2013 2:25 PM

Qualified Instructors Place in Curriculum Resources

8/9/2013 7:05 AM

Nutritional knowledge of instructor's constant change in nutritional information the students ability to comprehend information

8/7/2013 1:37 PM

Educational limits by the instructor (instructors qualification) hours allocated by the secondary program competency of students, offering a second tract?

8/7/2013 11:48 AM

Educators being competent in nutrition

8/6/2013 9:57 AM

Traditional French Cuisine Lack of Nutrition Knowledge of Faculty Importance of healthy preparation techniques

8/6/2013 8:10 AM

Instructors are not educated on subjects Facilities are not designed to teach nutritional competencies Not enough teachers to facilitate education

8/5/2013 11:44 AM

Lack of nutrition education thus far with current instructors Lack of time with an already loaded curriculum Lack of motivation for participants since culinary arts is primary focus

8/4/2013 11:08 AM

N/a

8/2/2013 6:19 PM

1) It isn't seen as necessary 2) there aren't enough knowledgeable instructors 3) there is disagreement over what should be included in the curriculum

8/2/2013 4:17 PM

Time required for other skills/competencies Programming concerns within discipline Instructor commitment to teaching nutritional competencies

8/2/2013 10:06 AM

Responses for Question number 22- Compose what you believe would make a nutritional position statement related to the needed level of nutritional competency in post-secondary culinary curriculum.

Every student participating in the post-secondary culinary curriculum should demonstrate a complete understanding and strong foundation of nutrition in relation to food to prepare them for the current and emerging nutritional issues they will encounter in their future careers.

9/6/2013 4:05 PM

Chefs need to be well versed, not experts, in nutrition with a good foundation and the skills to identify, create menus and execute the preparation of food

9/6/2013 9:29 AM

As culinarians we should have the knowledge to accurately prepare foods according to a variety of customer preferences.

9/3/2013 11:01 AM

Unsure? This would take more research....I would assume that this subject should hold equal or more importance than that of cost of menu items/recipes and that of use of local product...

9/2/2013 10:38 PM

Culinary nutrition woven throughout the lecture and lab contact for all culinary arts and baking pastry students is in line with providing tools for them to meet needs of the dining public.

9/2/2013 12:16 PM

Human nutrition has been proven to correlate with the overall health and longevity in the population of the United States. Students enrolled in post-secondary curriculums in hospitality management and culinary educations have a responsibility to be knowledgeable with regard to the dietary guidelines and how to provide services and meals in keeping with these standards of practice.

9/1/2013 8:46 PM

I feel in post secondary culinary curriculum, it is important to have a strong nutritional competency because that is something that is very big in the industry today.

9/1/2013 8:27 PM

With an aging population, the high rate of obesity, and growing allergy concerns, culinary professionals have a significant role and responsibility to fully understand dietary principles in order to service the public in such a way as to become a trusted source for serving food that meets the customer's nutritional need. Post-secondary curriculum and their competencies must meet this growing demand in order to be marketable to the jobs market and provide the foods necessary to keep the general public healthy.

8/31/2013 11:31 AM

Students will understand the importance of sound nutrition to the overall well-being of the guest/customer and will incorporate accurate nutritional practices in the preparation, service, and marketing of menu items to clients

8/30/2013 8:09 PM

Understanding how food nourishes our bodies we can incorporate food choices accordingly

8/30/2013 7:04 PM

N/A

8/29/2013 1:22 PM

With an aging population, the high rate of obesity, and the growing allergy concerns, culinary professionals have a significant role in the nutritional field. Post-secondary curriculum and their competencies must meet this growing demand in order to be marketable to the jobs market and provide the foods necessary to keep the general public healthy.

8/28/2013 4:06 PM

Nutrition education is no longer a vague or unappetizing topic; it is a rapidly growing integral part of our food choices and our culture.

8/28/2013 10:51 AM

Students should master the basics of nutritional science and practice the application of nutritional approaches in the preparation of all dishes and baked goods.

8/19/2013 9:55 PM

Our program strives to improve the health of Americans through food by effectively equipping post-secondary culinary students with the knowledge and skills necessary to create, analyze, and market healthier food.

8/16/2013 2:25 PM

One of the first steps to improving health is educating yourself in nutrition. For culinary students, nutrition education provides a self-improvement and the relationship of nutrients to food sources. In the last few years, healthy cuisine has become a trend within the food industry relating back to the simple concepts of healthy preparation of whole foods as well as alternate food sources for allergy and diet restricted customers.

8/9/2013 7:05 AM

We strive to have a balance of classical and basic cooking fundamentals while keeping with the nutritional needs of our consumers

8/7/2013 1:37 PM

We strive to provide whole foods, grains and will pro actively guide you through key nutritional information while limiting access to processed foods which will in turn allow our customers to stay focused and live longer healthier, productive lives



8/7/2013 11:48 AM

Students can demonstrate and prepare optimal products that meet the nutritional needs of the population throughout the lifecycle.

8/6/2013 8:10 AM

With the rising obesity in our nation among children and adults, there should be a considerable amount of time spent on ways to cook for healthfully, nutrition of foods and ways to cook for alternative food lifestyles--vegetarian, gluten free, vegan

8/5/2013 11:44 AM

Post-secondary culinary students need to obtain nutritional competencies to the extent at which they can fully understand dietary principles as they relate to medical nutrition therapies in order to service the public in such a way as to become a trusted source for serving food that meets the customer's nutritional need.

8/4/2013 11:08 AM

We understand the need for culinarians to be able to work in all parts of food service and believe that a basic knowledge of the concepts is worthy of learning.

8/3/2013 4:39 PM

Because good nutrition is vital to health and quality of life throughout the lifespan, we are committed to nutritional education as an integral part of our culinary program.

8/2/2013 10:06 AM

**Responses for question number 24-Serving as an expert member of this Delphi panel on the topic of integration of nutrition in post-secondary curriculum, please submit any additional comments or questions that might improve the development of this survey instrument.**

I believe there is a fine line between in depth nutrition classes and basic nutrition classes. I think the nutrition classes for any culinary curriculum should focus more on the menu planning, customer needs, preparation of food, cooking techniques, etc. If you delve into metabolic rate and exercise expenditure I think that falls into the dietitian/nutritionist's area of expertise.

9/6/2013 4:05 PM

In a restaurant environment the customer's choice is based on a number of items if not adhering to a strict diet - celebration, dieting at home splurging on the weekend etc.

9/6/2013 9:29 AM

N/A

9/2/2013 10:38 PM

Governmental regulations affecting types of nutritional information that must be posted Incorporating nutrition information in the training of hospitality wait staff in order to answer guest questions about products being served

8/30/2013 8:09 PM

For students of Alabama to pro actively target the current obesity statistics within the state and keep culinary knowledge on the cutting edge it is essential for students to understand the correlation between food selection and the positive effects on their health and that of the public understanding the long term effects. Culinary ethics should be essential to any culinary program bringing forth exceptional students who want to succeed well beyond the state of Alabama locally and internationally.

8/30/2013 7:04 PM

The challenge will be the transition to the culinary student the correlation of a fine dining experience and a nutritional based dietary appealing meal experience.

8/28/2013 10:51 AM

Review to what extent restaurants or chefs have a professional or moral imperative to produce healthy food.

8/19/2013 9:55 PM

Honored to have had the opportunity to participate.

8/9/2013 7:05 AM

If these changes do not happen soon we will not be acting ethically , if we know anything, we know the past has taught us that if we do not change our diets, activity and daily habits that obesity and high blood pressure will shorten our life span and will bankrupt this country ...

8/7/2013 11:48 AM

## **(Appendix 12–Educators Responses to Barriers to Teaching Nutrition)**

Time, Instructor resistance, Lack of skill in teaching the competencies

12/10/2013 8:13 AM

Basic cooking techniques applied from texts, Using traditional cooking methods in operations, Instructors who are experienced in such.

12/10/2013 6:35 AM

The current curriculum does not integrate nutrition throughout the coursework. Nutrition is handled as a single course and those concepts are not then utilized in other work. Additionally, many of the lab courses are taught by chefs that have no nutritional training as well.

12/9/2013 5:19 PM

Trends - what the media is covering changes daily

12/9/2013 12:20 PM

Other programs who claim to want to teach class Orientation to what is needed in industry Customer driven demand and govt regs about obesity

12/9/2013 10:00 AM

Science background of students time in curriculum chef instructors favor classical methods of food prep

12/5/2013 3:48 PM

Time- there never seems to be enough time to address everything we think is important. Student intelligence- there is no base line understanding of nutrition by the culinary population.

12/4/2013 1:36 PM

Money for wholesome ingredients Knowledge of culinary instructors/established curriculum Myths surrounding good nutrition

12/4/2013 8:38 AM

Status quo cost of technologies continuing education for faculty/staff

12/4/2013 8:11 AM

Many Chefs are not on board with healthy menu options Lack of interest leads to little personal research in the area of nutrition Emphasizing the importance of nutrition in relation to actual culinary practices requires research and commitment in the kitchen..everyone is just not that excited about it - But those of us who are rock nutritional competencies throughout classes taught.!

12/3/2013 5:53 PM

Funding for technology

12/3/2013 4:19 PM

Combining lecture and lab hours in one class

12/3/2013 12:44 PM

French cuisine is not a heart-healthy based cuisine. We do not have barriers to teaching nutritional competencies in our curriculum. We have a course CHEF1302 Principles of Healthy Cuisine that covers it all along with the required HECO1322 Nutrition course. Prices of specialty items, fresh produce, etc. may be a barrier to some - healthy does not mean inexpensive.

12/3/2013 10:51 AM

Students need to be versed in all areas of cooking. It is the individual who chooses to eat an unhealthy diet, not the restaurant.

12/3/2013 10:07 AM

Room/credit limits in the curriculum lab facilities budget constraints in purchasing products for labs.

12/3/2013 9:17 AM

RD instructors that have little or no knowledge of culinary techniques RD instructors with formal clinical education not culinary Disconnect between preparation of food and nutritional effect

12/3/2013 9:12 AM

Nutrition education administered by biology departments for nursing and health. Therefore the emphasis is on human use of nutrients not feeding

12/3/2013 8:46 AM

Indiana 120hour limit for undergraduate degrees

12/3/2013 8:37 AM

time curriculum restraints lack of resources for instructors not trained in nutrition

12/3/2013 8:27 AM

There is no reason that nutrition should not be included. Perhaps a challenge is finding qualified MS RD's to teach the courses.

12/3/2013 8:21 AM

Student interest other competencies compete for curriculum space Time in a 2 year program

12/3/2013 8:19 AM

Relevant Materials Qualified Instructors Cost

12/2/2013 3:54 PM

Limited space in curriculum faculty lack expertise in nutrition

12/2/2013 2:46 PM

Amount of Credit hours a curriculum can have and fitting in the appropriate courses to meet those competencies. Time allowable in the current classes to be able to thoroughly teach the competencies.

12/2/2013 1:11 PM

Academic level of math and science required for advanced nutrition courses; attitudes of existing faculty toward nutrition and/or healthy cooking methods

12/2/2013 1:04 PM

1. Not enough credits remaining in curriculum to incorporate 2. not enough skilled faculty members within our department 3. Nutrition is taught by a different academic unit at our university

12/2/2013 12:08 PM

Boring Students uninterested Faculty uninterested

12/2/2013 11:46 AM

Space in the curriculum

12/2/2013 11:11 AM

Instructor knowledge Time constraints Lack of engaging instructional materials

12/2/2013 10:57 AM

Lack of knowledge about the subject; lack of appreciation for the topic; viewed as a "hard science" so hospitality programs reluctant

12/2/2013 10:42 AM

I can't see the barriers, it just would take time to integrate it into the curriculum. That's just a process than can/should be done.

12/2/2013 10:07 AM

1. Students aren't interested (lack societal influences). 2. Historically, nutrition hasn't been "valued" in the culinary field. 3. Students don't perceive that there are job opportunities in nutrition (and they all want to be a "Top Chef").

12/2/2013 9:31 AM

Established curriculum does not emphasize nutrition Knowledge of instructors about nutrition Attitudes and beliefs of instructors about nutrition

11/21/2013 6:44 AM

1) Credit Limitations 2) Competing Academic Priorities 3) Competing Business Priorities  
11/20/2013 10:09 AM

Time, resources, delivery methods  
11/18/2013 5:39 PM

Lack of qualified nutrition instructors Lack of lab time to explore recipe modification attempts  
11/18/2013 12:52 PM

Degree plan limits on total hours. Student interest. Student motivation.  
11/18/2013 10:27 AM

Lack of appreciation for the subject Lack of dialogue between and among related fields (chemistry, sports science, etc) Lack of "interesting" learning materials  
11/15/2013 7:58 PM

Interest of culinary faculty, knowledge & skill of culinary faculty,  
11/15/2013 4:23 PM

Faculty knowledge Time Level of importance placed on topic  
11/15/2013 12:53 PM

Faculty expertise, time in the courses and curriculum, student interest  
11/15/2013 12:33 PM

We just do not do it..  
11/15/2013 10:55 AM

Student apathy Instructor lacking appropriate background Lack of continuing education opportunities  
11/15/2013 10:29 AM

Curriculum requirements for degree.  
11/15/2013 4:56 AM

Instructor knowledge department resources funding  
11/15/2013 1:19 AM

Cultural restrictions  
11/15/2013 12:26 AM

Not in the curriculum limit on the hours students must take  
11/14/2013 9:49 PM

Limited curriculum hours using registered dietitians only to teach  
11/14/2013 9:25 PM

Students are not prepared to learn the material -course requirements prohibit adding more classes to the current curriculum -some students aren't interested in learning the material  
11/14/2013 5:24 PM

Dietitians do not relate well to culinary and hospitality students. Dietitians do not take teaching culinary and hospitality as seriously as they do students in their own discipline. Culinary instructors do not stress nutrition in the laboratory curriculum..  
11/14/2013 5:24 PM

1) Lack of consistent information from research (for example, and yes, I am being simplistic: Are carbs good for you or bad for you?); 2) Governmental and Association guidelines seem one-sided and it seems to dissuade critical thinking; 3) the corresponding fault some faculty have with assuming that competencies, especially with scientific-content, are quantitatively measured, and may be uncomfortable allowing for varying nutritionists to have opinions based on critical analysis of current research.  
11/14/2013 4:58 PM

Accreditation requirements Industry demands Not available curriculum mapping strategies

11/14/2013 12:58 PM

1. Lack of appropriately credentialed instructional staff (RD, RDN) 2. Competition for time with teaching of culinary techniques. 3. Lack of integration of nutritional instruction and opportunities for demonstrating competencies with culinary coursework

11/14/2013 10:36 AM

Time is limited when teaching culinary. Need to educate instructors how to incorporate into some classes.

11/14/2013 10:00 AM

The amount of time needed to add more competencies. Many students feel they are already learning too much about nutrition Please consider a simplification of Nutrition texts to make students feel that they can better master more of the theories and the entire culinary/nutrition concept.. ie too many details added into a 2 year culinary degree scares the bejeezes out of many culinary students

11/14/2013 9:37 AM

There's no barriers!

11/13/2013 7:53 PM

lack of expertise in the subject the instructor feeling like they cannot teach as an expert because they are overweight  
lack of interest from the students

11/13/2013 1:46 PM

The preparedness of the high school student when they enter College. The student's belief system. The family system or lack of family system as the student is raised.

11/13/2013 1:42 PM

Lack of qualified RDs on staff Insufficient pool of chefs with nutritional cooking experience Quality textbooks

11/13/2013 12:14 PM

You cannot always include nutrition Government regulations rewriting the curriculum

11/13/2013 12:09 PM

program requirements in general; faculty knowledge of topic; hospitality more focused on operations not nutrition

11/13/2013 10:38 AM

if add additional content to a course, something else has to "go"; if adding additional courses, then something else has to "go"; as consumers we say we want healthy but our actions do not support that

11/13/2013 8:34 AM

Hospitality educators do not value/ are "afraid" of the biological sciences Industry partners indicate little interest when helping to design/update culinary curriculum culinary students are very under prepared for learning nutrition science concepts

11/12/2013 4:32 PM

1. Basic nutrition knowledge of instructors 2. Time constraints 3. Classroom time vs. lab time

10/30/2013 9:30 AM

Curriculum and number of courses are already more than most community college majors have to take. Adding more would be very difficult. Lack of instructional expertise. Only one faculty member has training in this area. The community is not strongly in favor of this.

10/29/2013 8:52 PM

Lack of nutritional knowledge No experience cooking healthy No personal experience with nutrition

10/29/2013 6:53 PM

1 nutrition classes based in biology department, do not apply concepts to culinary arts 2 biologists teaching culinarians 3 time available in a two year curriculum

10/29/2013 4:21 PM

1. Curriculum objectives 2. Time/credit hour limitations 3. Student interest

10/29/2013 4:10 PM

Faculty expertise Cost Developing curriculum

10/29/2013 3:59 PM

1. Lack of subject matter expertise. 2. Availability within the curriculum to add more nutrition courses. 3. Lack of funding to hire educated nutrition faculty and/or lab space and software programs.

10/28/2013 10:57 PM