

Identification of Essential Food Skills for Skill-based Healthful Eating Programs in Secondary Schools

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ABSTRACT

Objective: To identify the food skills deemed essential to include in skill-based healthful eating programs in secondary schools.

Methods: Fifty-one food experts including home economics educators, chefs, nutritionists and dietitians, community educators, homemakers, and young people were recruited by invitation, mail, and advertising. Data were obtained by interviewing these food experts over 3 months.

Results: The identification of food skills forms the preliminary data for the first study of 3 in the design of programs in secondary schools. The data were reviewed for emerging themes and were coded by applying content analysis procedures.

Conclusions and Implications: Food skills required for young people were described under 4 themes as the areas of expertise required for young people to live independently. Understanding these skills would support teachers in designing programs that would address behavioral capabilities to improve young people's food preparation and eating behaviors.

Key Words: adolescents, curriculum, home economics, qualitative research (*J Nutr Educ Behav.* 2010; ■:1-7.)

INTRODUCTION

Increased rates of childhood obesity and inadequate dietary intake of healthful food, especially fruits and vegetables, by young people are significant concerns for health professionals.¹⁻⁵ As health professionals working in schools, home economics educators have a significant role to play in young people's lifelong learning about healthful eating behavior.^{6,7} They have the nutritional background and pedagogical expertise to understand young people and their world, crucial elements in designing successful healthful eating programs.⁸ Moreover, their background in practical food preparation skills makes them well placed to design healthful eating programs and to teach young people food skills that prepare them for life.⁹

Home economics educators design and implement many skill-based healthful eating programs.^{6,9,10}

However, these programs seldom report a descriptive outline of the content, which makes it difficult to assess whether or not essential skills are included in the program design. The aim of this study, therefore, was to identify food skills deemed essential to be included in the design of skill-based healthful eating programs by interviewing 6 groups of "food experts" and determining common themes.¹¹ The themes will be used to develop a checklist for the evaluation of existing similar programs operating in secondary schools. This evaluation instrument can then be used as a basis of determining successful and sustainable skill-based healthful eating programs.

METHODS

A social constructivist paradigm was adopted here, in which the learner's uniqueness is acknowledged and used as an integral part of the "learn-

ing by doing" process.¹² Several theoretical models were reviewed,¹³⁻¹⁷ and although these models provide useful conceptual insights, none of them focuses on the acquisition of food skills. Therefore, a grounded theory approach was used,^{18,19} rather than researching and developing a hypothesis, data are collected as the first step and then itemized by codes extracted from the text generated by interviews. This systematic social science research approach enables the generation of theory from qualitative data. For this particular study, this approach enabled selected "food experts" to raise concepts from which themes could be identified in order to build a conceptual model of food skills acquisition. "Young people" refers to school-aged children commonly known as "adolescents" and aged 12-18 years. "Skill-based healthful eating programs" refers to practical classes in schools involving food preparation and cooking.

Fifty-one participants were divided into 6 groups and termed "food experts" according to their potential to identify the essential food skills required for a skill-based healthful eating program in secondary schools. Four groups were selected using criteria for their professional expertise working with or training young

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doi:10.1016/j.jneb.2009.12.002

people how to cook: home economics educators, chefs, dietitians (or nutritionists), and community educators. The remaining 2 groups were selected using criteria for their “hands-on” life experience: homemakers with more than 10 years of making meals and young people 5 to 10 years older than the targeted group, living independently and responsible for their own meal preparation. They were from a range of backgrounds and were contacted by advertising in community centers, universities, local gymnasiums and youth centers, professional association newsletters, conferences and Web sites or identified and contacted by mail or personally invited to participate in the research. The interviews took place over several months in various locations in Melbourne, Australia. Prior to the interviews, ethics approval was granted by the Deakin University Human Research Ethics Committee. The interview questions based on the definitions (see Table) were designed to generate data about consumer habits (food-related shopping skills, including decision making), food planning, preparation, and cooking skills.

Through face-to-face, semistructured interviews using open-ended questions, information was sought from each of the groups about what the group members considered to be the essential food shopping, preparation, and cooking skills required for young people to live independently. A pilot test of a random selection of 3 experts was used to test the face validity of the questions. Prior to the interview, interviewees were provided with definitions of the key terms used in the interviews. Probes were used to clarify or to extend an interviewee's responses or when definitions were used interchangeably.

Interviews were audiotaped, and the transcribed text was segmented into similar categories, which were then organized and integrated into selected codes. This process of data analysis, based on a grounded theory approach and Mayring's recommendations for thematic analysis, was used.²⁰⁻²² This 2-step process involved inductive category development (revising and reducing the text until the main categories emerged) and then identifying codes based on the

categories. The qualitative software program N-Vivo (version 7, QSR International Pty Ltd, Melbourne, Australia, 2006-2007) was used to manage and explore the data and allowed the author to conduct these 2 steps systematically to generate the common food skill themes.

Initial data coding of text content was checked manually and verified using the specifications in the N-Vivo software program. Recording dated memos within N-Vivo also formed part of this data analysis reflection and was the means by which the author kept a reflective diary, deemed as a mandatory step toward achieving data validity and minimizing researcher bias.²³⁻²⁵ Diary keeping and iteration of data collection and analysis provided data immersion, another important step in the process of data analysis.^{21,26} This immersion process also allowed scrutiny of any contradictions in the data (negative or deviant case analysis) and enabled comparisons and contrasts to be made between and within the groups of food experts.²⁶

After checking for duplication of content through the iterative process of data analysis, several of the original subcategories were collapsed into the categories, which subsequently became the themes and subthemes. Several codes (“Safety and Hygiene” and “Consumer”) overlapped and were considered to be relevant by the interviewees in the 3 categories of Knowledge, Information, and Skills.

RESULTS

A condensed outline is given below based on the interview questions (Table), which ultimately generated the themes and subthemes of the essential skills required for a skill-based healthful eating program.

Knowledge

The food experts spoke about the importance of taking young people to markets and shops to help them recognize quality fresh food in season and to provide opportunities for them to develop consumer confidence by consulting with food sellers. Emphasis was given to schools taking responsibility for in-

creasing young people's awareness of environmental sustainability. One dietitian explained:

I think schools have a responsibility in helping children understand environmental sustainability in terms of food and the costs of food practices and production—and how young people can make better choices, particularly with regard to knowing about ethical farming and manufacturing practices.

Knowledge of different cooking methods was considered to be important, so that individuals could select and apply the appropriate method to achieve the best product outcome and how a cooking method could be substituted in a recipe so that the nutritional value of a dish was tailored to meet the health, dietary, and budgetary demands of the consumers. Homemakers, home economists, and chefs nominated basic items of equipment to stock a kitchen but recognized that young independents would not have the money, nor would they be willing to allocate that limited amount of money to what could be perceived as unnecessary kitchen gadgets. For this reason, they spoke about the need for young people to know about cheaper or substituted alternatives if the appropriate item of equipment was not available. One freelance home economist said:

. . . On cooking shows they don't show you a substituted utensil or item of equipment—for example, you don't need a whisk—you can use a fork to whisk up scrambled eggs. So those very practical skills and knowing what to do when you don't have a particular item of equipment are important.

Home economics educators in schools were nominated by all participants as having an important role in exposing young people to new food taste experiences outside their traditional and culturally acceptable food. Taking students to restaurants and markets or having them host international days at school were identified as opportunities that help young people to enrich their outlook culturally and socially, not only by exposing them to different food, but also establishing links between food and people from different cultures. Schools, specifically

Table. Definitions of Terms and Interview Questions Posed to Food Experts

Definitions	Interview Questions
<p>“Knowledge” includes a personal awareness and understanding about nutrition and what would constitute a nutritious family-type meal. For example, knowing the Healthy Living Pyramid (Australian equivalent of the North American My Pyramid Plan) and applying the <i>information</i> to help select ingredients to make a well-balanced and appetizing meal.</p>	1. Thinking about nutritional family-type meals, what <i>knowledge</i> must individuals have to shop, prepare, and cook such meals?
<p>“Information” includes examples of written or electronic data such as recipe and nutrition books, periodicals, and pamphlets, and Web sites and on-line help from personal contact experts. Information obtained from these sources would help to inform an individual’s knowledge.</p>	2. Thinking about nutritional family-type meals, what <i>information</i> must individuals have to shop, prepare, and cook such meals?
<p>“Skills” require an application of <i>knowledge</i> and include hands-on practical ability to be able to plan, shop, prepare, and cook a meal.</p>	3. Thinking about nutritional family-type meals, what <i>skills</i> must individuals have to shop, prepare, and cook such meals?
<p>“Resources” may include human (energy, motivation, people other than teachers or facilitators of cooking programs) and nonhuman (time, cooking equipment, and transport) assets that would assist an individual to plan, shop, prepare, and cook a meal.</p>	4. Thinking about nutritional family-type meals, what <i>resources</i> (other than knowledge, information, and skills) must individuals have to shop, prepare, and cook such meals?

home economics classes, were also identified as having a role in exposing young people to enjoyable food tasting and cooking experiences, particularly for those young people who may have had limited access to enjoyable food and eating experiences with their families.

Members of all the groups mentioned the need to have meal planning knowledge, for example, planning ahead and making a shopping list based on the meals scheduled for the week and the household budget. Planning in advance of shopping means consulting with household members to accommodate their dietary requirements and preferences and checking pantry and refrigerated food stock. Homemakers indicated that planning ahead allowed time for young people to consult recipe sources (eg, cookbooks, Web sites, family) to ensure that a variety of interesting and flavorful meals using seasonal produce was produced instead of over-relying on the usual narrow range of meals always consumed. Professional food experts (chefs, home economists, dietitians) advocated maintaining a stock of food items and knowing about the versatility of ingredients that could be used for “emergencies,” whereas young independents mentioned struggling with this idea:

I like to cook but when it's just for me I can't be bothered so I'll end

up having toast. It would be good to know what things I can have in my pantry that I can use to cook quickly and easily to make a meal. I mean that's a gap in my knowledge.

Chefs and home economics food experts discussed household economy in terms of substitution of resources—young people saving money by purchasing cheaper cuts of meat, but investing more time and work in planning, shopping, preparing, and cooking.

Not surprisingly, several dietitians highlighted budgeting and healthful meal planning based on food groups, complementary protein sources (animal protein replacements to reduce costs or to cater to vegetarians), food combining and fresh produce. One nutritionist provided this recommendation to guide young people on meal planning:

I always emphasize and use the Healthy Living Pyramid to show how that 60% of your weekly food dollars should be spent on the eat most section, 30% on the protein section, and 10% on the high-sugar and high-fat content part of the Healthy Living Pyramid.

Food experts were keen to emphasize that nutritional knowledge be taught in the context of enjoying a wide variety of food and fulfilling

an individual’s daily activities. Those working with young people acknowledged that teaching young people nutrition in terms of short- or long-term health outcomes was pointless and that it was more productive for them to focus on the energy- and stamina-producing qualities of food and how nutrient-dense food would contribute to “looking good.” Young, independent food experts themselves were keen to know about nutrition more as a “consumer tool” to help them make effective food purchase decisions, as they felt that food shopping was confusing. They wanted nutritional knowledge about food additives, food portion sizes, and vegetarian diets and about making healthful food options tastier.

Chefs, homemakers, home economists, and dietitians talked about troubleshooting as an important component to include in a skill-based program to reassure young people that mistakes do happen but can be anticipated with cooking practice and experience or avoided by assessing recipes and reading and following instructions before and during the cooking process. Troubleshooting was not identified specifically by the young independents.

Information

Food literacy, identified as an Information subtheme, was nominated

unanimously by all participants as a critical component to include in a skill-based healthful eating program. Food literacy was seen mainly as an individual's ability to read, understand, and act upon labels on fresh, frozen, canned, frozen, processed, and takeout food. Participants discussed how food manufacturers and advertisers promote their products for market share and acknowledged how bewildering this is for consumers making effective food-purchasing decisions. One young independent food expert verified this:

Food labels are ambiguous—even if you can read labels, then how does that equate to the individual and what they need, and where does that fit into the daily diet? Also, a product might be 99% fat free, but it might be higher in sugar and sodium. So it's not simply having an understanding of being able to read the food labels; it's more about understanding the nutritional background. And it's not just a matter of picking something off the supermarket shelf and saying that it's low in fat—because it might be low in fiber or have high sodium as a tradeoff.

Consumer information advertises new product availability and also informs individuals where to source and how to use and evaluate items of kitchen equipment appropriate for their own requirements. It also includes information on using an item of equipment for a particular function: why a metal spoon is more effective than a wooden spoon for folding in egg whites, for example.

Participants also identified and evaluated various sources of information for developing skills in young consumers. These sources included: point-of-sale food sources (supermarkets, farmers markets, and markets) and food expos, cook books, cooking shows on television, and the Internet. One home economics educator discussed the merit of using different sources:

They will get their information from the Internet and to some extent from magazines—they are bombarded with information—there is no shortage of information, but accurate information from the

Australian Consumers Association and Nutrition Australia would be helpful. But I think that the Internet and even SMS [Short Message Service] and podcasts are good sources of information; however, these need to come from credible sources, and it's important for teachers to teach their students consumer literacy so that they can discern between the information put out by a food manufacturer, compared with a fast-food chain compared with Nutrition Australia. Schools have information technology and visual literacy, but they also need to have food and nutrition literacy.

Skills

All participants shared food shopping as an experience, so understandably, consumer skills were nominated as an integral component to include in a skill-based healthful eating program. Homemakers, home economists, chefs, dietitians, and nutritionists all identified strategies to increase young people's consumer skills. With planning, shopping, and preparation skills, young people are empowered to make their own meals from fresh and seasonal food produce and flavoring ingredients instead of relying on takeout food and expensive convenience food. Although young people were seen to be discriminating consumers, it was recognized that their lower confidence in negotiating with fresh food sellers, and possible limited access, might preclude them from buying quality and cheaper produce and subsequently relying on supermarkets for their food requirements. Young independents reported using sources other than supermarkets. They used consumer skills to shop around and to help them make purchase decisions. Although young independents agreed that supermarkets were convenient as a "1-stop" shop, issues such as family-sized packaging created problems with storage and scaling down recipes.

All participants felt that the *process* of learning was equally important as learning the essential skills. While working in teams, young people learned cooperation and scheduling skills, but it was also important to al-

low young people to work individually to develop their independence.

In addition, for those young people with special needs, opportunities to practice and repeat tasks are essential for their skill acquisition. One home economics educator working with special needs students explained:

With special needs children, it is important that we address their needs so that we can modify their tasks so that they can acquire skills in the kitchen. Parents can be reluctant to let their children cook—perhaps an occupational therapist or the home economics teacher needs to visit the parents to identify the problem so that they can learn and can succeed. Those children need more practice, not less, and in a school situation, they are often the ones who hold back and let others take over.

Meal skills incorporate all stages of food preparation and cooking, from the moment a meal component is taken from the pantry or refrigerator, to it being prepared, cooked, and ready for meal service. It means choosing and applying food preparation techniques (peeling, slicing, dicing, chopping, and browning) safely and correctly and matching appropriate technique with the style and purpose of the dish. It also means adapting meal components and basic food preparation skills to create meal variations. Young independents specified this as a useful skill.

Preliminary tasks—such as thinking through the meal process and carefully reading recipes deconstructing them into manageable tasks so that the meal components are prepared and cooked sequentially, ready for service at the same time—were also identified as meal skills. Homemakers and young independents suggested that coordination of the cooking process is an important skill, but one of the hardest skills to learn correctly. Many commented that food timing and sequence were skills they learned through trial and error, whereas chefs and home economists talked about this being a crucial component that they taught in their skill-based programs.

Hygiene and safety knowledge skills in the kitchen were named as fundamental components to include

in any skill-based healthful eating program. At the operational level, these skills included an individual's ability to safely use and store sharp knives and cooking equipment to prevent cuts, scalds, and burns. All participants spoke about the importance of individuals preparing themselves for food preparation tasks: tying hair back, washing hands before and after food handling, and wearing an apron and applying first aid skills when necessary. Some participants spoke about food storage skills: transporting food home from the supermarket, how best to store fresh food (particularly fresh meat and poultry) to prolong freshness and quality, and how best to safely thaw frozen food and to preserve its quality. Finally, chefs and home economists recommended teaching young people how to manage cleaning tasks pre- and post-food preparation and cooking as part of the process of meal preparation.

Resources

Resources are those components that support the success of skill-based programs, but they are not part of the essential skills; rather, they consist of recommendations identified by the food experts on how a healthful eating program could best be supported. Based on the interviews, resources were classified under 3 themes: motivation, parental involvement, and community (friends, peers, community, and government) involvement.

Motivation was one of the recurring themes throughout the interviews and was perceived to be integral to program success and the key that engaged young people. All food experts spoke about the importance of creating an enjoyable atmosphere that allowed young people to experience success through practice, trial, and error. Those participants working with young people spoke about the importance of engaging the peer group, recognizing that young people value each other's opinion. They encouraged young people to keep an open mind when trying new food and to participate in program design. They recognized the role of television in young people's world and subsequently provided opportunities for them to have fun

with food by simulating television cooking shows. Homemakers, home economics educators, chefs, and dietitians also spoke about engaging young people through food-related and environmental projects such as growing their own vegetables at home or at school. Those home economics educators and chefs who delivered community-based cooking programs successfully used "story telling" and "games" to engage not only young children, but also older young adults, linking history, amusing anecdotes, and culture with the food, especially new food that was beyond the realm of their taste experiences.

Chefs, home economics educators, and homemakers spoke about how they prepared young people for independent living (students and their own young adult children leaving home for the first time) so that they associated cooking with enjoyment. Making tasks easier by giving them a selection of basic tools and equipment, a list of essential pantry items, and basic favorite recipes along with the opportunities for them to practice the associated skills beforehand were among the recommendations made.

Parents were seen to be a major influence on young people's eating behaviors, certainly in the childhood years, and this finding is endorsed in the literature.²⁷ Some of the strategies used to involve parents included inviting parents or grandparents along to workshops, special celebratory occasions, or cultural days at schools, but food experts agreed that it was difficult to involve parents in these events if they worked during school hours. A skill-based program involving parents also provides opportunities for parents to learn new food skills and eating rituals alongside their children (particularly if the parents have limited skills). Supporting and encouraging parents to allow their children to practice food preparation and cooking skills at home and be more involved in family decision making related to shopping, preparing, and cooking family meals were other ideas mentioned. Homemakers and young independent food experts agreed that parents needed to take responsibility in allowing their children to build up their food experiences, praising them for the effort and overlooking the "mess" as part of the learning process, too.

Community resources were important for 2 groups of young people: those able to access skill-based healthful eating programs in schools and those who needed to rely on community resources for help with developing their independent living skills. For those young people unable to access skill-based healthful eating programs in schools, there are community resources available to them, but they need to know how and where to access them and be able to afford them. For this reason, participants endorsed skill-based healthful eating programs in schools as the most accessible means of young people developing the skills required for independent living. Further, they recognized that community resources could "value-add" to existing school programs by extending and enriching program content, making it more interesting and enjoyable for the learners and connecting them with their local community. Restaurant and market visits, street culinary tours, guest speakers from industry, and chefs-in-residence are all examples of community resources cited that could be incorporated into program design. Nongovernment and government agencies also contributed health promotional information via Web sites and pamphlets that also enriched and validated program content. It was important that young people are aware of these community resources so that they could access them once they left school and lived independently.

The friends and peer groups of young people, in addition to parents, were described as a collective community resource available to help young people once they finish school and live independently. Friends and peer groups remain an important source of information and skill development through recipe exchanges and communal food making in each other's homes, thereby extending the teamwork experiences gained through skill-based programs at schools.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Many different components considered to be essential for skill-based

healthful eating programs were identified in this study. This preliminary study, as the first of 3, is specific in its identification of the essential food skills and components that underpin skill-based healthful eating programs.

In response to diminishing food skills in young people, British government and nongovernment agencies have developed several skill-based programs that have explicitly listed and described these essential skills. The list of themes and the skills outlined in the programs provides program designers with a foundation on which to build their programs.²⁸⁻³⁴

Several strategies were recommended by food experts for inclusion in program design. Facilitators were encouraged to provide opportunities for young people to work in small groups and to practice and repeat tasks.

Motivating factors are seen as an essential influence on young people's eating behaviors.³⁵ One way of ensuring that young people's motivational factors are accommodated into healthful eating programs is to involve them in the early stages of program planning and design (M. Caraher, *Cooking Skills and Young People*, unpublished work, 2007). Program designers of skill-based programs used various strategies to motivate and involve young people in their programs.^{28,29} These strategies match the recommendations made in this study and included allowing young people to select and cook their own recipes, which also helped to accommodate any vegetarian and general eating preferences.

Other recommendations made in this study were involving parents and the community. Programs that effectively involved parents and the community included *Licence to Cook* and *The Cook-It Club*.^{29,32}

Involving parents, either as volunteers or by simply informing them of initiatives, seems to be the key in program design (M. Caraher, *Cooking Skills and Young People*, unpublished work, 2007). Several food experts (and program designers), however, spoke about the difficulties of actively involving parents in the programs (mostly because of their own paid work commitments at the same time the school programs were delivered), either by working alongside their children as volunteers or as guests or help-

ing to evaluate programs by overseeing and assessing their children's food production at home. Other programs effectively used regular newsletters to disseminate program news and to provide parents with general information about food preparation and cooking matched with what was being delivered in the classroom.^{27,36}

Involvement of members of the school and local communities was considered to be another key factor in contributing to successful healthful eating programs. These members were used to enhance program content and delivery (food shops and services, local government and recreational facilities) and more broadly in establishing school food policy (food service personnel, school administration).

The method used in this study was well suited to its purpose. The findings confirmed the essential skills identified in the skill-based healthful eating programs reported in the literature. Consistency in the different themes and categories was stabilized after half of the interviews were analyzed, with the remaining interviews confirming the interpretations. The limitations of this study include a relatively small group of food experts and the use of a localized and convenience sample of food expert participants who may not be representative of food experts elsewhere. The study generated findings that support the need to involve key stakeholders in program design—young people (and how to motivate them), their parents, teachers, school, and community. The results of this first study may be helpful to program designers working with similar populations; however, their generalizability can be assessed only through further research.

ACKNOWLEDGMENTS

Thank you to Tony Worsley, PhD, Professor of Public Health, School of Health Sciences, University of Wollongong.

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