NUTRITION 2030

The Elderly Nutrition Program: Contributing to the Health and Independence of Older Adults

A WHITE PAPER ON TECHNOLOGY

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How you gather, manage and use information
will determine whether you win or lose."

--Bill Gates*, Business @ the Speed of Thought*

INTRODUCTION

Advancements in technology, specifically computerization, are spawning rapid changes throughout society (1-3). The implications of these changes are significant for the Elderly Nutrition Programs (ENPs), as these advancements will have an impact on almost every facet of these programs. Areas that will be affected by technological advances include the following: identification of older adults in need; on-going assessment of nutritional status; preparation and delivery of meals to both homebound older adults and participants at congregate sites; and recording and reporting of outcomes/results of all of nutritional interventions.

This white paper identifies eight *assumptions* that likely will affect ENPs. It outlines expected *implications* of each assumption on the operation of ENPs. Finally, it examines some technologies that are currently available and those that can be expected to be available in the future to assist ENPs in adapting their programs and operations to meet the challenge of delivering nutrition services to older adults in 2030 and beyond.

Predicting the future is always risky, but it is particularly so today because technological development is proceeding at such a rapid rate (2,3). For the purposes of this discussion, however, we have made one major supposition, namely that the computer, in one form or another, will serve as the major technological tool used by ENPs. Exactly how the computer will be utilized is conjecture; but based on our knowledge of existing computer technology, we have devoted considerable attention to describing ways in which we envision the computer may be used by ENPs in the future. We have included an array of other technologies as well; many of which are dependent upon the computer. They include the Internet, videophones, automatic voice recognition programs, CDs, DVDs, software and programs, food preparation systems, packaging equipment, and process that produce genetically modified (GM) and fortified foods. The description of the uses of these technologies follows the list of key *assumptions* and *implications* in narrative form. We have chosen to present the information in this manner, rather than to address technology issues after each assumption in order to avoid the redundancies.

ASSUMPTION #1. *The number of older adults in need of food and nutrition services will increase.*

Currently, Baby Boomers represent a third of the total population, and by the year 2010, the 50-plus age group will increase by 48% (4,5). By 2030, one-third of the U.S. population will be over 65 and control two-thirds of the nation's personal wealth (4). Put another way, today, more than 33 million adults (13% of the American population) are aged 65 years and older; by 2030, this number will

increase to 70 million (20% of the population) as baby boomers age. Older minorities will increase from 13% in 1990 to 25% of older adults in 2030 (6,7).

Today, nearly one in ten older adults lives in a home where the yearly income is below the poverty level (8). Some groups are particularly vulnerable: single older adults, women, Blacks and Hispanics.

Implications: The fact that the frail older adult population itself will increase means that many more people will need the services that ENPs provide. These needs go beyond the one meal a day five days a week. The broad scope of nutrition screening, assessment, education, counseling, intervention, monitoring and outcomes documentation are needed to insure the most cost effective and beneficial nutritional care.

ASSUMPTION #2*. Demand for private and public funding for older adult programs will increase. Therefore, ENPs will need to document favorable outcomes in order to compete effectively for funds.*

Federal and state concerns relative to Medicare/Medicaid expenditures will continue to grow. Competition for private and public monies will increase, particularly if bare-bones resources continue to be allocated to older adults programs relative to allocations for other programs, such as child nutrition programs.

Implications: Advocates for ENPs will have to present increasing amounts of convincing data on the cost efficacy of providing food and nutrition services to older adults, showing that the services prolong the capacity for independent living. Congress, state and local governments and other agencies that control funding must be reminded that the most successful treatment is disease prevention. Meals have been shown to be cost effective when compared to the cost of hospitalization and institutionalization of poorly nourished older people. Also, in order to generate support for older adult nutrition programs, up-to-date information must be provided to the media so the need is continuously in the minds of the public. Most significantly, programs will have to be operated in a cost-effective manner. A database that is sensitive to the nutrition services used by older adults, as part of the evaluation process, is needed. Service delivery should be seamless with people receiving needed services as part of an ongoing continuum of care, that is outcome oriented.

ASSUMPTION #3*. Concern for food safety and proper sanitation procedures will increase*.

Implications: All facets of the older adult foodservice programs will come under greater scrutiny as compliance with the Hazard Analysis Critical Control Point (HACCP) system becomes more important (9). Meal preparation, delivery and reconstitution systems will be inspected for compliance with HACCP standards or newer strategies that are more effective (10).

ASSUMPTION #4*. Older adults will desire more varied nutrition services, including menu choices that are nutritious, culturally appropriate and meet their expectations of taste and quality.*

Hollingsworth recently reported in *Food Technology* (4),

> Baby boomers were spoiled with choices from the time they were born. Their expectations for products and services mass customized to meet their needs changed the entire retail and foodservice environment during the second half of the 20th century. This is not expected to change in the 21st century. In fact, demands may increase as baby boomers age and want to take advantage of products and services that will allow them to live to very old ages. In the food they consume, they will expect a variety of flavors, textures, colors and shapes. In addition, they will be ever more health conscious, looking for foods and supplements that will allow them to maintain maximum energy throughout their long lives.
>
> …Consider what the Boomers came of age with: Starbucks Coffee at $2 plus, branded bottled water, premium juices, organic foods, brewed iced tea in a bottle.

Older adults want healthier food without sacrificing taste and enjoyment. This assumption indicates that during the next 30 years older adults will expect to have choices in the foods they eat and the services they receive.

Implications: Meal programs will have to deliver a variety of food and nutrition services in a cost-effective way, taking into consideration older adult expectations and needs.

ASSUMPTION #5*. The costs of medical care are likely to continue to rise. Helping older adults, especially minorities with health disparities, stay out of the hospital/nursing homes will be a critical component of cost containment. Nutrition will continue to be a significant component in improving health status.*

Implications: The percentage of minority older adults is growing. Therefore the increased burden of disease on these individuals, caregivers and communities will result in additional health care costs unless technology assisted outreach is in place. There will be a need to perform nutrition screening, assessments, interventions, as well as sound nutrition information to older adults and their families. Among the problems that older adults characteristically face are diminishing appetites and less energy for cooking, lack of knowledge about cooking/shopping for one or two individuals, difficulty managing modified diets, and physical limitations such as arthritis, partial paralysis due to strokes, diabetes and multiple sclerosis. Problems such as congestive heart failure, vision impairments, depression, and other chronic problems of aging may also affect functionality. Meals and assistive therapies such as MNT, tube feedings, enriched foods and new scientifically proven interventions that maximize independent living could be some options of tomorrow.

ASSUMPTION #6. *Greater ethnic diversity in ENP participant populations will result from the fact that minority populations will be increasing proportions of the total older adult population.*

By 2050, non-Hispanic whites constitute only 67% of the US population in comparison to 85% in 1995. Non-Hispanic whites will make up 16% of the older adult population compared to 5% in 1995. Blacks, Asian Pacific Islanders and Native American will also comprise a larger proportion of the general population and therefore also the older adult population. (6,8) A culturally competent staff sensitive to the needs of the diverse populations served will become increasingly important.

Implications: These ethnic changes will affect ENP participants' expectations and demands. Population groups of differing ethnicity will want culturally appropriate foods available regularly. Minority older adults are at disproportionate risk of preventable chronic and infectious illnesses and disease-related disabilities. Identifying and reaching out to these populations becomes more important as the proportion of minorities increases. Technology can help document the outcomes of earlier nutrition interventions. This will create opportunities for expanded services and input from culturally competent professionals and staff.

ASSUMPTION #7. *Competition for labor will be greater than ever*.

Implications: Finding staff and volunteers will be challenging and require innovative solutions. There will be an on-going need for recruitment, training and retention programs for volunteers and staff. Marketing to potential employees and volunteers will need to be creative in order to attract population groups that have not otherwise been in the ENP workforce. For example, recruiting efforts will target older executives who may be 'lent' by their companies to assist an ENP, high school teens working to fulfill their community work requirements, military personnel from well-staffed bases, and volunteers from colleges and universities who want to be involved in community activities. Another potential labor source for paid employment are people over-65 who still want to work, but who now wish to work in less stressful careers. Churches, civic organizations and clubs should also be contacted in an effort to increase minority community representation in all aspects of the ENP.

The labor situation will affect the staffing levels that are possible in ENPs. Unless there is a radical change in the population or in the economy, programs will have to be operated with as little labor as possible to keep costs contained.

ASSUMPTION #8*. ENPs will need to partner with one another and with private industry to gain economic and social advantages.*

Joining with programs in neighboring towns and cities can result in profitable ventures. The American Dietetic Association's position on the management of health care food and nutrition services (11) emphasizes partnerships with vendors to reduce inventories and waste. Efficiencies that may result include:

> on-line order entry with comprehensive cost analysis, planning and reporting features; elimination of the traditional functions of receiving, inspecting, and storing because the vendor is accountable for delivering the specified product (quantity and quality) on time; reduction of …storage space because the vendor is providing products just in time for production and services; elimination of the buyer's order-placement function because the vendor has computer access to

the buyer's perpetual inventory levels and can automatically generate an order to ensure that resources are available when needed.

Perhaps the most useful partnerships will come with home healthcare agencies, which can offer nursing and related care, infusion therapy, hospice care, respiratory therapy, home medical equipment and management services (12).

Implications: Program directors/managers will need to have the expertise that allows them to operate ENPs that are efficient, cost effective, and provides older adults with the meals and services they need. In order to develop this expertise, some managers will need training and all will need to stay up-to-date on the newer management tools and systems. They will also benefit from sharing information with one another in order to find new solutions to problems.

USING TECHNOLOGY

The use of technology will improve operations, increase efficiency and bring cost effectiveness to the ENPs. Therefore, more older adults will be served, relationships with other community agencies will be enhanced, and the use of health care resources will be conserved. For example, outreach will be easier through off-site computer kiosks in places frequented by older adults and their families. These interactive computers will be direct linked to ENPs so older adults can inquire about and register for services in real time.

Once an older adult is ready to receive ENP services, pertinent information about the individual will be entered into a database. Electronic benefits transfer cards (EBTs) could be issued. The "computerized record" will become an increasingly valuable tool. All information, such as nutritional assessment, education, counseling, the meals received, etc., can be simultaneously updated and shared.

Also available will be automatic voice recognition systems whereby information about the older adult's medical and nutritional status can be spoken into a database. Currently, software is available for customization of reports used by long-term care facilities that can be applied to the activities of an ENP.

Software can record the results of nutritional intervention by monitoring the health-status information about each client involved in an ENP. Up-to-date information can be available about numbers of individuals in need, their ethnicity, locations, etc. In addition, outcome data can be collected and reported regularly. This information can be used for comparisons with other programs receiving public funds, i.e., WIC, National School Lunch Program, Special Milk Program and others (13). The information can also be used to show savings in medical costs, reduced hospitalizations, shortened hospital stays, and delays in admissions to long term care, etc.

Sophisticated programs that have already been developed for managed care and clinical information systems could be adapted for ENPs in the future. They could be used to justify the costs of providing meals through managed care to needy subscribers in place of admission to an acute or long-term care setting.

A number of ENPs already have websites that describe their services and provide information for enrollment. Private pay clients could order and pay for food and nutrition services online. Computers and databases can also be used to acknowledge participant contributions and to recruit other donors who in turn can be notified by e-mail that their contributions have been accepted. Donors can authorize contributions through their computers in systems similar to current day shopping networks.

ENP managers will have to find ways to produce more meals for less. To do so they must investigate the possibilities of using technology to their advantage, from administrative functions, to menu development and food preparation, scheduling and delivery. Centralized production and satellite distribution, some using cook chill, cook freeze and *sous vide* technologies are assisting foodservice operators to contain costs, maintain consistent standards and guarantee food safety. Advances in containers and carts in which food is transported before rethermalization contribute to the product quality.

Training materials on CD-ROMs, DVDs, web sites and Intranet sites will be more common. Interactive training programs will alert all those working with ENPs to the need for new food safety and sanitation procedures, as well as the steps to meet HACCP standards. Certification in safe food handling will be available via computers and distance-learning programs.

The development of equipment that is easier to clean and maintain will aid individual food preparation sites in adhering to HACCP standards. Equipment that assists in compliance with HACCP standards will be needed. Blast chillers (mobile), for example, will be increasingly common.

Also supporting HACCP compliance are thermometers with high levels of sensitivity that will allow more precise gauging of temperature during cooking and holding. These thermometers will be connected to monitors that will alert cooks to temperature fluctuations; the monitors will also automatically adjust the heat so temperatures do not fall below or above specified safe levels.

Centralized food production systems, many of which make use of cook chill, cook freeze, and *sous vide* technologies, will become increasingly affordable for all sized operations. These systems, if used properly, can assist managers and cooks to comply with HACCP standards, including extending the shelf life of meals. However, the food prepared in these systems must be handled properly every step of the way. Increasingly sophisticated technology will be used in delivery systems so meals are shipped safely in chilled, frozen or heated forms. Also, the equipment for reheating or cold keeping in the older adult's home will be more sophisticated and easier to use. Automatic sensors that turn off heating devices when they are not needed will be part of most equipment.

Technology will allow these systems to work. Software and equipment will reformulate recipes appropriately for chilled, freezing, and shelf stable technology. Software is available to provide drivers with routing information; and mobile phones allow drivers to communicate with a central dispatcher any time during the delivery process.

Equipment will include temperature-controlled holding carts and integrated temperature monitors and recorders for refrigerators and freezers. One of the most significant advancements will be protocols for automated equipment so information can be exchanged between equipment and a central management PC (14). In addition, technologies such as irradiation will contribute to food safety.

Providing choices is often perceived as a cost issue. Therefore, programs will need systems that allow for the cost-effective production of several different types of food items. Information sharing between programs that allow choice and those deciding to do so will help make the transition. Choices should not be limited to substituting carrots for sweet potatoes, but rather the addition of softer foods, enriched foods and ethnically preferred foods as appropriate. Foods not eaten offer no nutritional benefits.

Technologies that will be used more frequently to allow more menu variety at a reasonable cost include cook chill and cook freeze systems This equipment is most suitable for centralized facilities; however, some can be used at individual preparation sites. Because food is not prepared just in time, different products can be made throughout the day, stored and made available to older adults as part of the normal cycle of meal delivery.

Centralized food production systems that eliminate the need for just-in-time preparation will be used more frequently, which will reduce the amount of labor needed. Also reducing the need for personnel will be shelf-stable packaging and partnerships with mail carriers so meals can be delivered directly from the production facilities to the recipients. This will reduce or eliminate the reliance on for volunteers who make daily deliveries to homebound recipients of meals.

The way food is packaged will affect the number of choices that can be offered. This will be increasingly important. Baby boomers have grown up grazing and snacking, not eating three meals a day. It is unlikely they will change their habits when they grow older. Therefore, “meals” will have to be packaged so older adults can eat portions through out the day if desired. The packages themselves will also have to be easy to open.

Selecting menus with a lot of variety and nutrient density will be possible with software specifically designed for this purpose. Sophisticated systems are now available and promise to become more affordable and easier to use in the future. With one keystroke, recipe software now can globally change ingredients for entire organization.

Contributing to the variety of foods available will be advancements in genetic engineering (15). A feature article in *Food Technology* stated (16)

> Today, a mere three years after the first large-scale commercial harvest, genetically engineered crops cover one-fourth of U.S. cropland—more than 90 million acres, according to 1999 industry estimates. That includes more than 35 percent of all corn, almost 55 percent of all soybeans, and nearly half of all cotton. Some have come to market as whole foods; others find their way into processed items. In

all, 50 genetically engineered crop plants have been approved by the Department of Agriculture (USDA), though some aren't yet being grown in large numbers, including potatoes, tomatoes, melons, and beets. Others, such as rice, wheat, cucumbers, strawberries, apples, sugar cane, and walnuts, are still being grown on test sites." Also used for livestock, leaner cows, and extra meaty hogs.

The International Food Information Council reported (17)

> The International Service for the Acquisition of Agribiotech Applications reported that the global area of biotech crops grew from 4.3 million acres in 1996 to 27.5 million in 1997 and 67.5 million in 1998 (excluding China)." However, genetic engineering continues to be controversial "between activists, concerned consumers, regulators, scientists and food manufacturers, particularly in Europe, and particularly over the safety, ethics, environmental impact and projected benefits of biotechnology.

Another rapidly developing area is the formulation of functional foods and nutraceuticals with added antioxidants, calcium, fiber, folate, lycopene, echinacea and St. John's Wort. The Grocery Manufacturers Association estimates that functional foods alone will represent a $24-billion-a-year market within the next few years (18). Consumers are accustomed to products fortified with the nutrients they need.

Better tasting and more attractive pureed foods are becoming more readily available. Research is under way to monitor tastes of older adults so seasonings can be adjusted.

Older adults will also be accustomed to convenience. Some ENPs provide grocery shopping and delivery service for homebound older adults today. For those able to prepare some meals, this is a great help. More and more private companies are now offering free delivery of groceries that are ordered over the Internet.

Touchscreens are increasingly popular in restaurant and foodservice operations. Their application for home use is exciting because screens are easy to use by people of all ages.

Getting accurate, culturally appropriate nutrition information to older adults will be an important aspect of helping them maintain their health. A study of nutrition information in the media concluded that the major source of nutrition information for older adults tends to present a misleading picture of healthful eating (19).

Technology that allows older adults to "tune in" to sites may help people sort through the fallacies and find the facts. Interactive technology also may assist older adults because they can ask questions and receive answers to specific questions. ENPs will need to be at the forefront of integrating current nutrition issues into the materials that are used for education of clients, volunteers and staff.

Computers will enable people who speak different languages to communicate. Using hand-held computers, persons delivering meals can speak to the recipient, then replay their words in the language preferred by the older adult.

The use of technology for training will allow simultaneous translation into several languages.

Computers and video/DVD will be used for interactive training, thereby freeing personnel to do other jobs. Some hands-on, personal-contact training will always be needed, but technology will obviate the need for each trainee to receive continual attention from a trainer. Distance-based learning will provide new and effective ways to get information to those who need it but who cannot attend courses at established institutions.

Food production systems that eliminate the need for just-in-time preparation will be used more frequently. This will reduce the amount of labor needed. Also reducing the need for personnel will be shelf-stable packaging and partnerships with delivery companies/US mail.

The need for nutritionists and dietitians that are ethnically diverse, as well as culturally competent, will be greater than ever, not only to determine nutrition risk and monitor participant progress, but also to provide direction to nutrition programs. The use of technology will assist the nutritionists and dietitians in reaching a greater number of older adults than ever before. Videophones and translation programs will help them communicate better, as will information from data bases that are connected to medical institutions. A seamless care system is possible only if information can be shared among all caregivers.

To contain costs, ENPs will likely operate large commissaries that use from-scratch food and/or food purchased pre-made by outside suppliers. More ENPs are likely to organize ordering based on bids from multiple vendors using software (11).

ENP will need management expertise in the future. They will have to find ways to adapt and to share information with other ENPs and members of the aging network. Innovation that comes from within the organizations must be shared to obtain greatest efficiency.

SUMMARY

Aging Baby Boomers will present challenges to American society unlike any that have come before. Technology has great potential to be a supportive tool for ENPs. Like all tools, technological tools require an investment of money and time. They also must be used appropriately in order to realize a return on investment. Though we may not be able to predict all the forms that technology will take during the next 30 years, if the past decade is a harbinger of the 21st century, the use of technology, from computers to videophones to food processing equipment, will increase dramatically. ENPs can benefit greatly from technology if they learn to embrace it and make it work on behalf of all ENP personnel, volunteers and most important the older adults in need of meals and nutrition services.

RECOMMENDATIONS

Once the aging network decides that ENPs *must* catch up and keep up with technology, Elderly Nutrition Programs will be better able to meet the challenges of the future.

1. Fill infrastructure technology gaps in Elderly Nutrition Programs:
   - Implement funding standards at all levels that require a dedicated percentage of the annual budget for technology improvements.
2. Commit resources to technology for the systematic and continuous improvement of products and services:
   - Use technology to create value, individualize service and improve customer satisfaction;
   - Use technology to improve administrative systems; and
   - Use technology to address the scarcity of labor tomorrow.
3. Focus on documenting outcomes to make ENPs more competitive for scarce dollars:
   - Use technology to improve outreach to the most nutritionally needy;
   - Use technology to improve nutrition education, screening, assessment, interventions, care management, choice, etc.; and
   - Communicate program benefits to the media, funders and potential donors.
4. Establish a total network perspective on food safety, beyond food production
   - Use technology to purchase, produce/contract and serve the safest food possible;
   - Use currently available software for menu planning, scheduling, routing, purchasing, NAPIS and other tracking of information; and
   - Use healthy alternatives brought about by food technology, including genetically modified and functional foods.
5. Establish computer networks of ENPs and partnerships with other agencies to share and learn from each other, to maximize savings in labor, purchasing costs, record keeping, purchasing decisions, delivery efficiency. Potential partners are schools, universities, US Postal Service, other delivery companies, vendors, hospitals, HMOs and other related businesses.
6. Use technology to increase access to services by all older adults regardless of ethnicity, assure personal safety, eliminate physical and transportation barriers, and increase social interactions with home delivered meal recipients, and encourage personal responsibility and dietary change.

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