Fortified Food and Supplements: Approaches for Long-Term Care Residents

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"To cure sometimes, to relieve often, to comfort always". –Hippocrates

Food and dining are key components of quality of life and quality of care for residents in long-term care homes. The prevalence of protein energy under-nutrition for residents ranges from 23 per cent to 85 per cent, making malnutrition one of the most serious problems facing health professionals in long-term care. Malnutrition is associated with poor outcomes and is an indicator of risk for increased mortality. It has been found that most residents with evidence of malnutrition were on restricted diets that might discourage nutrient intake.[1] Researchers, Nutrition Managers, and Registered Dietitians alike have been looking at ways and methods to fortify foods without increasing the volume of food consumed.

What exactly is a fortified food? Health Canada defines food fortification as "a process by which vitamins, mineral nutrients and amino acids are added to foods to provide consumers with sufficient but not excessive amounts of certain nutrients in their diet."[2] There is both mandatory and voluntary fortification of foods at present. Mandatory fortification includes addition of vitamin A and D to milk,

for example. Meal replacements or nutritional supplements for the purposes of this article can be defined "a formulated food that, by itself, can replace one or more daily meals or as a food sold or represented as a supplement to a diet that may be inadequate in energy and essential nutrients."[3]

FOOD GUIDES AND RECOMMENDATIONS

Exactly how much food do seniors require? Do we need to fortify or supplement our menus? Let's look at what provides us with our current recommendations. Canada's first food guide, the Official Food Rules, was introduced to the public in July 1942. This guide acknowledged wartime food rationing, while looking to improve the health of Canadians. It identified six food groups: milk; fruit; vegetables; cereals and breads; meat, fish, and eggs. Specifications for adult portioning did not come into effect until 1961, however, older adults were not included in the guide until 2007! This was a step in the right direction, and Registered Dietitians agree that the recommended portions of food for an older adult can be excessive and unrealistic. Advocacy work for a food guide for seniors has been ongoing for years and we continue to look for methods to provide additional nutrients while minimizing volume, hence fortified foods and supplements.

Then there are the Dietary Reference Intakes (DRI), which is a system of nutrition recommendations from the Institute of Medicine (IOM) of the National Academies (United States) which is the general term for a set of reference values used to plan and assess nutrient intakes of healthy people. These values, which vary by age and gender, include Recommended Dietary Allowance (RDA). For a senior to meet their nutritional requirement and DRI, it could be difficult to consume the volume of food as proposed in the Canada's Food Guide and the amount of specific nutrients as required by the DRI, especially in light of all the challenges seniors face with eating.

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The number of seniors is growing and so are problems seniors face with eating. Dementia is also on the rise, which adds to concerns with getting enough nutrition. As of 2015, 47.5 million people worldwide were living with dementia. By 2030, that number will almost double. 1 out of 13 people over the age of 65 will have dementia and 60 to 80 per cent of residents in long-term care have diagnosis of dementia. As a result we are facing many seniors that are at risk of being under-nourished and having weight loss.[4]

The Canadian Frailty Network (CFN) describes frailty as "a patient health state associated with getting older; involving multiple serious health issues that increase an individual's vulnerability for extended acute care or end-of-life care." It can occur because of a range of diseases and medical conditions and can be the result of a minor problem that leads to a major change in a senior's health status. It is important to understand a senior's frailty when assessing for fortified and supplemental foods/diet. By 2025 and 2040, aging baby boomers are expected to dramatically expand the number of frail elderly. Statistics Canada reports that over 15 per cent of our population at the last census was over 65. For the first time, there are more people aged 65 and older than there are children aged 0 to 14 years and people age 85 years and over make up the fastest growing age group in Canada.[5]

Therefore there is an increased need for new guidelines targeted toward the special needs of older adults who have low food intakes. Even if entirely consumed, a diet (providing approximately 2,000 kcal/d) did not supply sufficient quantities of vitamins (vitamin E, pantothenic acid) and minerals (calcium, zinc, copper and manganese) to enable residents to meet recommended intakes for the senior population, as noted by research by Wendland *et al*.[6] Planning a menu that offers the appropriate levels of nutrients results in the provision of large volumes of food and energy levels

that are simply not feasible for this population, resulting in significant food wastage.[7]

FORTIFICATION OF FOOD

The fortification of food is not a new concept. The development of fortified products is feasible but it is extremely important to develop fortified foods that taste identical to the unfortified food in order for it to be consumed. It is equally important that there are those who either do not support the policy or at the very least think that an extremely cautious approach needs to be taken towards it. There are concerns, from various focus groups held by Health Canada, about tampering with food, what increased fortification really says about the nutritional state of the food supply, and the exact source of the added nutrients.[8]

Although limited evidence supporting a medicalized diet in older adults does exist, it is also important to note that these diets are often less palatable and poorly tolerated and can lead to weight loss. And as providers of food and nutrition in long term care, we know that weight loss is a far greater concern to the often frail nursing home resident.[9]

There are some foods that are already fortified such as:

- Salt – fortified with iodine
- Wheat products such as cereals – fortified with folate, B12, vitamin A
- Cooking oils – fortified with vitamins A and D
- Dairy – fortified with vitamins A and D

It is difficult to determine fortification levels for homemade recipes and if the fortification is even enough to meet the resident's nutrition goals/intakes. Often Nutrition Managers and Registered Dietitians work together to enhance an existing recipe and add either protein, fats, fibre or other nutrients, aiming for palatability versus exact nutritional content. Then there is the question of where to incorporate fortified recipes into the menu. Is it better to fortify a tried and true recipe that most of the residents will enjoy such as all mashed potato, all oatmeal, all soups? Or is it best on a case by case basis? And then there is the task of developing standardized recipes for optimal sensory acceptance and consistency.

Respect for the ongoing and changing needs of the resident should be the first consideration. If the resident is consuming all or most of the food, there may still be a need for fortified or supplemental foods as their nutritional needs are high, however, we delay weight loss and nutritional deficiencies by keeping our residents healthy and eating real food.

A much bigger consideration in my view is the dining room, specifically the social interactions of residents during dining. Can they feed themselves? What about staff knowledge, attitude and skills? Perhaps additional hospitality type training is needed. Are the portions sizes provided as part of the planned menu? Do the residents have adequate time to eat? And how does the food look and taste? Does some work need to be done to recipes? Are we monitoring if the recipe is being followed? Putting in five pounds of beef instead of eight pounds due to case size limitations will consistently render less nutrients day after day. Choice of food is also a very important factor. As we increase choice, residents tend to eat more.[10] And, we must keep in mind that even if a resident likes a particular food or drink and it is well documented in the care plan, they may not want the same item every day. This includes the fortified food, snacks or supplements.

Some current strategies in place in most long-term care homes include fortified comfort foods by way of skim milk powder, protein powder, margarine, mayonnaise, cream, eggs, additional fibre, commercial supplements, and pudding powders to name a few. Most of the fortified food in long-term care is prepared by food service worker.

In the Family Treatment Preferences Study,[11] families preferred (in the following order) these interventions versus food fortification and supplementation:

- Attractive food choices
- Quality staff assistance
- Snacks between meals
- Dining environment = preference
- Supplements
- Appetite stimulant medication

Supplements and medications are the most common approaches in long-term care, but families prefer behavioural approaches. Furthermore, almost all residents will eat more of their meals if staff spends enough time providing help. Supplements often have mixed results related to effectiveness. They are costly, often given inconsistently, and/or inappropriately (with meals). A 2008 study notes that residents consume 4x more calories from snacks than from supplement.[12]

Fortification comes at a cost and, at times, a portion of fortified mash potato, milkshakes or puddings can cost more than a portion of commercial supplements with the added time and effort of staff. Some approximate costs and comparisons for 125mL portion include:

- Fortified pudding is approximately $0.60
- Fortified shake is approximately $0.54
- Instant milkshakes is approximately $0.49
- Commercial supplements can range from $0.52 to $0.77

Most of this discussion was based on macronutrient fortification; however, just as some seniors find it difficult to meet their macro nutrient intake, such is the case with micronutrient intake as well. At this time, long-term care providers do not have access to micronutrient fortification processes and must still rely on pharmacological applications of vitamins and minerals vs. food, to entirely meeting needs. There is some research on micronutrient powder fortification for puree food, however, access to such is not yet available nor are there safety precautions in place to provide it to residents in long-term care.

WHAT IS THE RECOMMENDED STRATEGY?

The Nutrition Manager (NM) is a key partner in screening for residents who may require additional calories, protein and key nutrients. In addition, the NM should have a sound policy and process in place along with standardized/tested recipes for some standard and basic fortified foods. Their role

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is to monitor usage, consistency, palatability and safety of these products. A method for determining recipes that are not well accepted or taken should also be developed. A nutrition assessment will be completed by the RD for residents with weight loss, decreased appetite, skin breakdown, or other high nutritional risk concerns that require enhanced protein, nutrient and caloric intake. If appropriate, a fortified food will be added to their diet order. Or an alternate strategy is to fortify a couple of recipes for the entire resident group.

The NM and RD will customize a fortification and supplement program based on each individual resident's needs. An appropriate production system should be in place to identify fortified foods, snacks, supplements and control the recipe, time of delivery, food safety keeping and returns. Individual variations may also be added to this program as documented on resident's care plan, preferences, and diet control. Depending on the program developed by the NM and RD, it may not be appropriate for all residents – for example, lactose restrictions or renal – and a policy will need to be developed to clarify the program. Continuous Quality Improvement – PDSA (Plan, Do, Study, Act) principles are to be put in place to continuously improve on the fortification and supplementation program.

Some of the most commonly fortified foods in long-term care include:

- Soups – add dry milk or protein powder, cream, beaten eggs, or quinoa
- Potatoes – add sour cream, cream, dry milk or protein powder, butter or margarine
- Cereals – add cream, dry milk or protein powder, raisins, or butter
- Milk – add dry milk or protein powder or use homo milk
- Puddings – add dry milk or protein powder, cream, or peanut butter
- Gravies/sauces – add butter, cream, dry milk or protein powder, or mayonnaise
- Baked goods – add butter, cream, dry milk or protein powder, eggs, or peanut butter

Nutritional supplements also have a place when appropriately assessed. The pros: easy for staff, great nutritional profile, and reasonable price. The cons: boring for residents (taste fatigue), always sweet, much wasted, can't reuse.

The research shows that energy intake increases with supplementation but another randomized, controlled trial in three nursing homes with 63 residents found that offering residents a choice among a variety of foods and fluids twice per day may be a more effective nutrition intervention than oral liquid nutrition supplementation. The study also found that snack options are a more cost-effective nutrition intervention relative to supplements based on staff time, resident refusal rates, caloric intake and waste.[13] Some other suggestions are to work with your preferred vendors on flavour enhancers and spices to improve food taste and palatability. Many seniors take a multitude of medications that may impact their sensory taste buds and saliva production so continuous re-evaluation and assessment of intake and acceptance must be ongoing. Food trends must be considered in this area; for example, fortification with Greek yogurt and quinoa may be considered now, whereas five years ago these food items were not as trendy.

To conclude, food and dining is a significant element of daily living especially for seniors who live in long-term care. Would they choose a fortified food if that food met their current food choice criteria? And even if we approach food fortification on a case-by-case basis, is there benefit for a wider range of fortification of mashed potatoes, oatmeal and milk as all of our residents can be considered at nutrition risk? Either way, education, reinforcement and support is required to develop a fortification and supplement program. We need to think of supplements as medications; they require an order. It is the position of the American Dietetic Association that "the quality of life and nutritional status of older adults residing in health care communities can be enhanced by individualization to less-restrictive diets."[15] Although therapeutic diets are designed to improve health, they can negatively affect the variety and flavour of the food offered; therefore, there will always be a reliance on fortified and supplemental foods.

Choosing food before supplements, and food before medication should be the main priority. With choice, accessibility and individualization, our residents eat foods of choice throughout the day, and even during the night if need be, eliminating the need for costly, and often refused, commercial supplements.[16] Think of your 24-hour nutrition offerings, think about the choices you offer, think about the dining experience your residents are having, and think about the repetition of special snacks and supplements.

As NM and food providers, we need to advocate for the use of real food before the addition of dietary supplements, by recommending real food before any modified foods or single source nutrient powders/liquids ensuring our recipes are tasty and palatable in all consistencies. Instead of artificial supplements, extra protein, vitamin and fiber can be added to shakes and other real foods people like to eat. And a key component still remains to have a dining experience as natural and positive as possible.

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