FEASIBILITY ANALYSIS

1155 Pacific Street
Vancouver, BC, V6E 3X8

March 20th, 2022

Betty Wills
Director of Care
Lynn Valley Care Centre
1070 Lynn Valley Rd
North Vancouver, BC V7J 1Z8

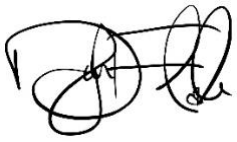
Dear Ms. Wills:

Here is my report, Feasibility Analysis of the Implementation of a Diversified Menu at Lynn Valley Care Centre. In the process of writing this report, I have gained an immense amount of knowledge about the design and implementation of menus in long-term care facilities. I hope that this paper will offer knowledge that will not only benefit Lynn Valley Care Centre, but add to the current body of literature on this subject. Thank you for your assistance throughout this process.

I recognize that there are numerous considerations when procuring, modifying, and implementing a menu in a long-term care facility, so I hope that this paper offers suggestions that can be taken into review upon later revision of the menu. The literature review that accompanies this report reveals the extent to which malnutrition affects clients of long-term care. I believe that this matter, accompanied with the incorporation of culturally-relevant foods and personal preferences, would benefit the quality of life of your clientele.

I have thoroughly enjoyed the breadth of work that went into this report, and would be happy to answer any questions. Please contact me at 519-278-6245 or email dylanflach@gmail.com at your convenience.

Sincerely,



Dylan Flach

Feasibility Analysis of the Implementation of a Diversified Menu at Lynn Valley Care Centre

for
Betty Wills
Director of Care
Lynn Valley Care Centre
North Vancouver, BC

Dylan Flach
Student ENGL 301 99C

March 23rd, 2022

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Abstract

FEASIBILITY ANALYSIS

The feasibility of the implementation of a diversified menu at Lynn Valley Care Centre depends on the preferences of clientele and the overall interest in culturally-relevant diets, as well as the nutrient distribution of the current menu.

Consumption of food preferences and cultural foods are innately important to maintaining a sense of self and, in turn, promoting an optimal quality of life. Moreover, dissatisfaction with the food at one's disposal can be a notable driver of food insecurity that leads to reduced food intake, increasing the likelihood of malnourishment and unintended weight loss. The clients of Lynn Valley Care Centre were determined to be dissatisfied with some areas of the food service sector, and so amendments are suggested for improved quality of life .

Further, it is of utmost importance that long-term care facilities provide nutritionally-adequate diets that offer diverse and adequate nutrients for health promotion and a reduction in disease incidence. The menu at Lynn Valley Care Centre was assessed to be nutritionally inadequate in a range of vitamins and minerals. Thus, it is recommended that the menu is revised to include a broader array of nutrient-dense food items.

In brief, recommendations for diversifying the menu are as follows:

- Maintaining appropriate temperatures of hot foods.
- Managing the quantities served depending on client appetite.
- Enhance supplementation for those with low consumption.
- Incorporate specific client preferences into the menu, including those that are culturally-relevant.
- Modify the menu to comply with the dietary reference intakes of clientele.

I. INTRODUCTION

Populations in long-term care (LTC) facilities are often at an increased risk of malnutrition and low quality of life (QOL) due to the pre-existing conditions that result in their admission. Malnutrition arises in part due to food insecurity, which "exists when all people, at all times, have physical, social and economic access to sufficient, safe, nutritious food to meet their dietary needs and food preferences for an active and healthy life" (Food and Agriculture Organization). In LTC, social and economic access are of limited concern as facilities allocate funds to the procurement and provision of food, and social issues are mitigated as provision is equal across the range of clientele. However, there is concern for issues of physical access. LTC clients may have an impaired ability to self-feed, especially those with cognitive or physical impairments (Vucea). As such, clients may require the assistance of a Registered Care Aide during mealtimes. LTC facilities must be adequately staffed and trained to assist a range of clientele with limited feeding abilities as a result of dementia, dysphagia, stroke, and other disabilities.

This paper will focus primarily on the subset of food security pertaining to "dietary needs and food preferences" (Food and Agriculture Organization). There is evidence in the literature suggesting that menus in LTC facilities do not adequately fulfil the client's nutrient requirements and dietary preferences. Nutrition assessment is a useful tool for determining the nutritional adequacy of a diet, and as such, nutrition assessments are conducted regularly in LTC facilities. One particularly relevant form of nutrition assessment is dietary assessment, which assesses whether a diet is balanced and adequate in macronutrients (carbohydrates, fats, and protein) and micronutrients (vitamins and minerals). It is also important to consider the presence of disease that may impair absorption of nutrients. Biochemical assessments (e.g. blood and urine tests) can determine the content of nutrients within the body, while clinical assessments (e.g. physical exams) evaluate effects of the diet on the body. Further, unplanned weight loss acts as an important indicator of morbidity and mortality among populations in LTC (Black et al.). Combining these forms of nutrition assessment offer a comprehensive approach to determining nutrition and health status.

Individualized Nutrition Care Plan (NCPs) direct the provision and distribution of food in accordance with the seasonal menus in LTC facilities. NCPs are designed and implemented by the on-site Registered Dietitian as a means of ensuring that the unique dietary needs of clientele are met. This may include reduced sodium intake for clients with hypertension, increased protein to help treat pressure ulcers, or restrictions on fluid intake to balance electrolytes in the body. Further, modified texture diets (MTDs) are often prescribed among LTC clients with feeding impairments and as a means of reducing incidence of dysphagia (Vucea). As such, the menu design must allow for variations to accommodate the diverse needs of clientele.

It is thought that the likelihood of becoming malnourished tends to be higher when food dissatisfaction is high, as LTC clients are less likely to consume sufficient quantities of food when palatability and appearance are perceived negatively. Dietary preferences are influenced by a wide range of factors, with socio-cultural influences seen as particularly crucial (Das & Priya). Analyzing how socio-cultural influences affect food choice can increase understanding of the impact of fundamental social relations on nutritional food security (Das & Priya). In the context of LTC, a lack of emphasis on individual preferences, including cultural and familial factors, could result in reduced interest in mealtimes, decreased QOL, and malnutrition.

A. Purpose and methods of this report

Based on a review of key research and primary data collection from clients of Lynn Valley Care Centre, this report assesses whether the current menu promotes food security. Fourteen clients completed the survey as the primary data source, which can be found in the appendix. Secondary sources include research into culturally-relevant food practices and best long-term care nutrition practices. Recommendations will be provided as necessary for diversification of the food service menu by improving the consideration of client preferences, culturally-relevant food practices, and the utilization of local ingredients. The overall aim is to enhance client quality of life by way of food service satisfaction and diet quality. The intended audience is Lynn Valley Care Centre Director of Care Betty Wills and fellow administrative staff.

B. Scope of this inquiry

This report plans to determine the extent that food preferences influence food insecurity and client quality of life, evaluate the feasibility of switching from current food practices to culturally-relevant and preference-based practices, and provide recommendations for increasing nutrient profiles of menu items and meals**.**

II. DATA SECTION

A. Sources of food service dissatisfaction.

Food service satisfaction was evaluated using an online survey that was distributed to clients at Lynn Valley Care Centre. In this context, food satisfaction was evaluated through a combination of food quality, quantity, appearance, and appropriateness in relation to personal preferences and culture. Of the total thirteen questions, ten were close-ended, while the remaining allowed participants a chance to provide their opinion on the subject matter.

1. *Quality of food*

Participants were asked to evaluate the quality of the food, in terms of palatability, taste, and temperature. Figure 2 details the client's satisfaction with meals and snacks. Figure 3 shows the client's perception of the taste of the food. Together, the results of these questions reveal that overall food quality is perceived positively, with the majority of participants finding that the food tastes good, and it is always or sometimes enjoyable. It is important to note the results of the question pertaining to hot foods, with 50% of participants finding they were not the correct temperature, although cold food is generally found to be cold enough.

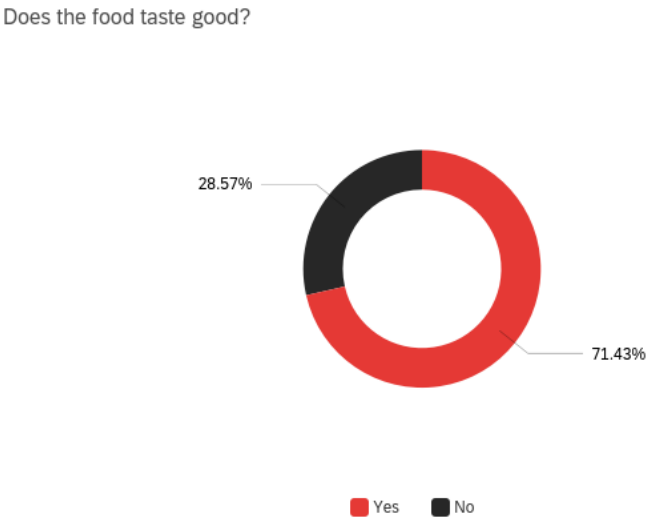

Figure 1: Taste: Participants were asked whether they thought the food tasted good. 71.43% said yes (n = 10) while 28.57% said no (n = 4).

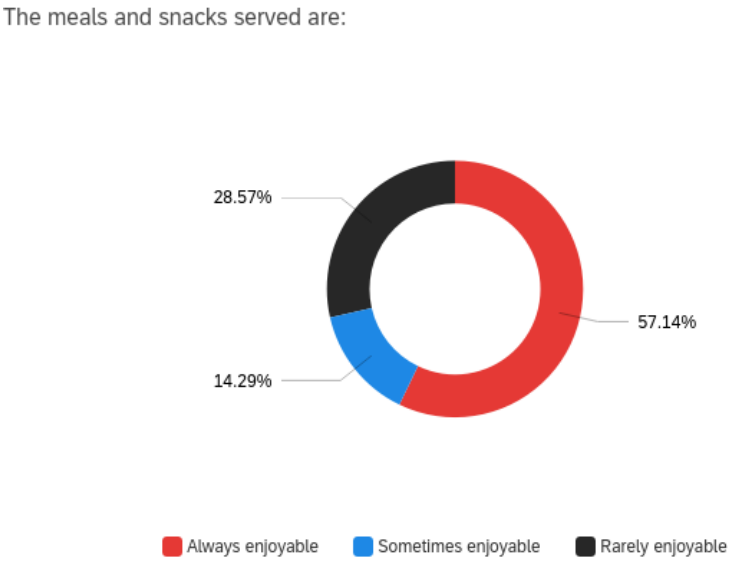

Figure 2: Participants were asked whether they thought the food was enjoyable. 57.1% said always enjoyable (n = 8), 14.29% said sometimes enjoyable (n = 2), and 28.57% said rarely enjoyable (n = 4).

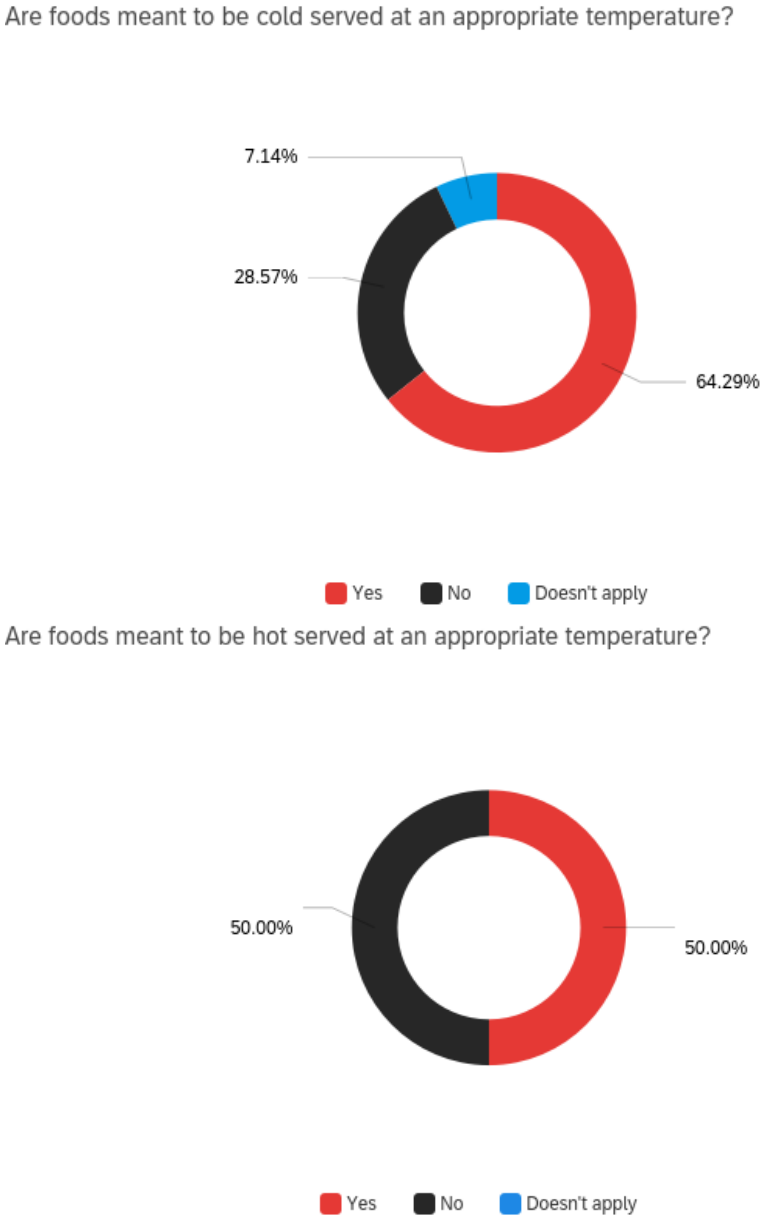

Figure 3: Participants were asked whether they thought the foods were served at an appropriate temperature. For hot foods, 50% (n = 7) said yes, and 50% (n = 7) said no. For cold foods, 64.29% (n = 9) said yes, 28.57% (n = 4) said no, and 7.14% (n = 1) said it doesn't apply.

1. Quantity of food

Participants were asked to evaluate whether the quantity of food served was adequate. The results of these questions reveal that the vast majority of participants found that there was always or usually enough food available. Additionally, just over half of participants stated that they never eat most of the food that is served to them.

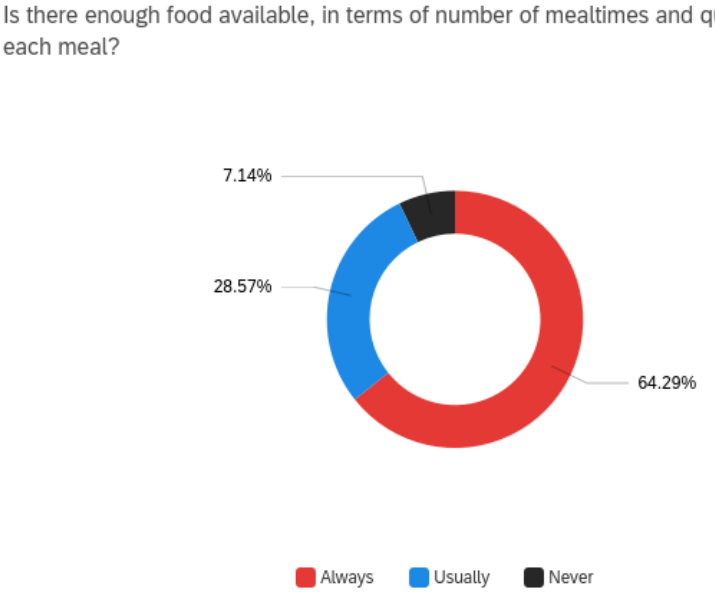

Figure 4: Participants were asked whether there was enough food available, considering the quantity of both mealtimes and food served. 64.29% (n = 9) said always, 28.57% (n = 4) said usually, and 7.12% (n = 1) said never.

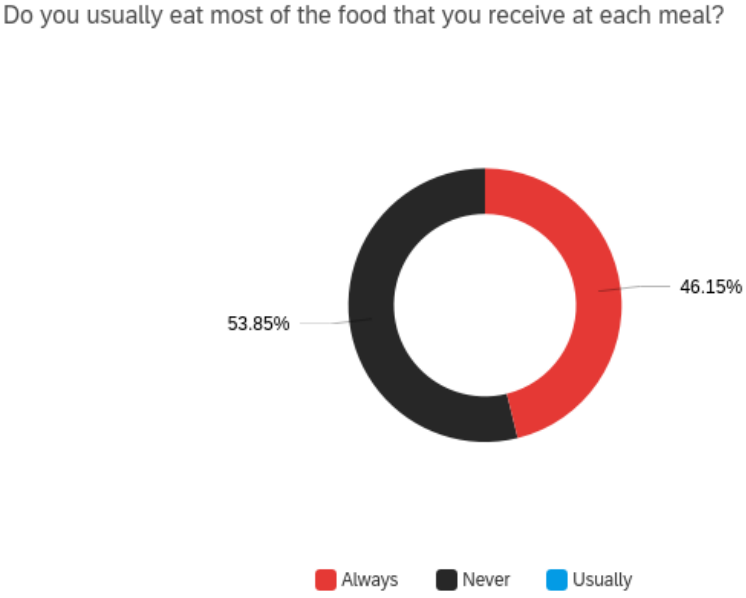

Figure 5: Participants were asked whether they ate most of the food they received at each meal. 46.15% (n = 6) said always, while 53.85% (n = 7) said never.

1. Presentation of food

Participants were asked whether the meals and snacks were presented in an attractive and appetizing fashion. The majority of participants stated they found the food to be visually appealing, though there is still a significant number of individuals who feel contrary to this opinion.

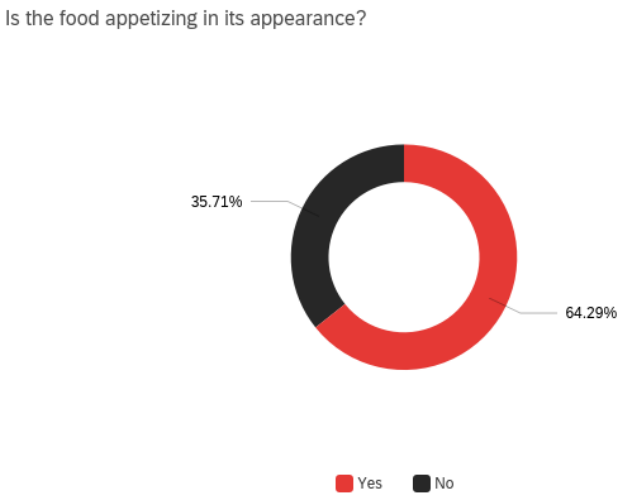

Figure 6: Participants were asked whether they perceived the food to be appetizing. 64.29% (n = 9) said yes, while 35.71% said no (n = 5).

1. Personal, cultural, and religious preferences

Participants were asked whether the food met their personal, cultural, and religious preferences, as well as the specific foods of which they liked, disliked, and desired. The majority of participants felt that the foods were always or sometimes suitable to special dietary requirements, and there was always or usually a secondary option if preferred. However, there is still a significant portion of individuals who thought that there was not another option offered to them. In terms of personal, cultural and religious preferences, many of the participants felt that this question did not apply to them. However, those that did felt equally strongly that the menu did and did not suit their individual preferences. Table 1 reveals that the list of disliked and preferred foods is substantial, and will be taken into account when making menu suggestions.

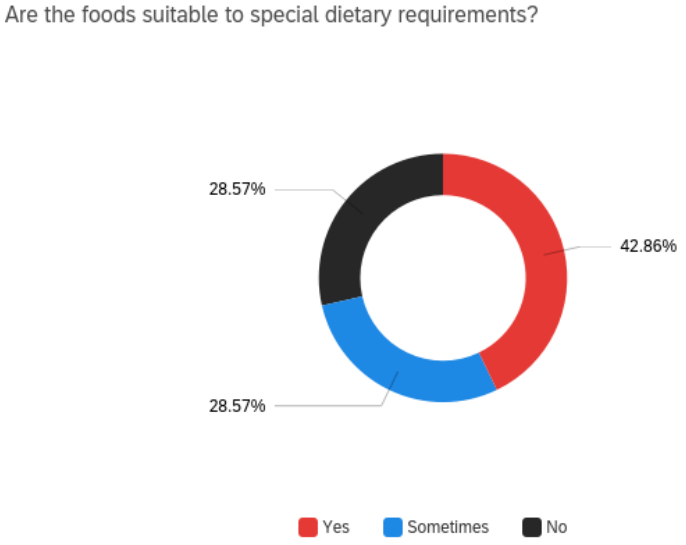

Figure 7: Participants were asked if they considered the foods suitable to unique dietary requirements. 42.86% (n = 6) said always, 28.57% (n = 4) said sometimes, and 28.57% (n = 4) said no.

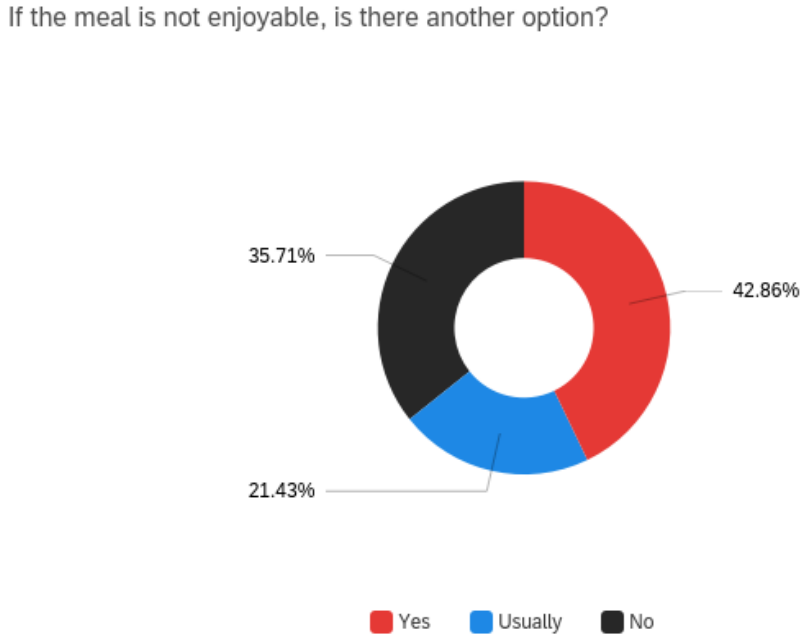

Figure 8: Participants were asked whether there was another option available if they disliked the meal served. 42.86% (n = 6), 21.43% (n = 3) said usually, and 35.71% (n = 5) said no.

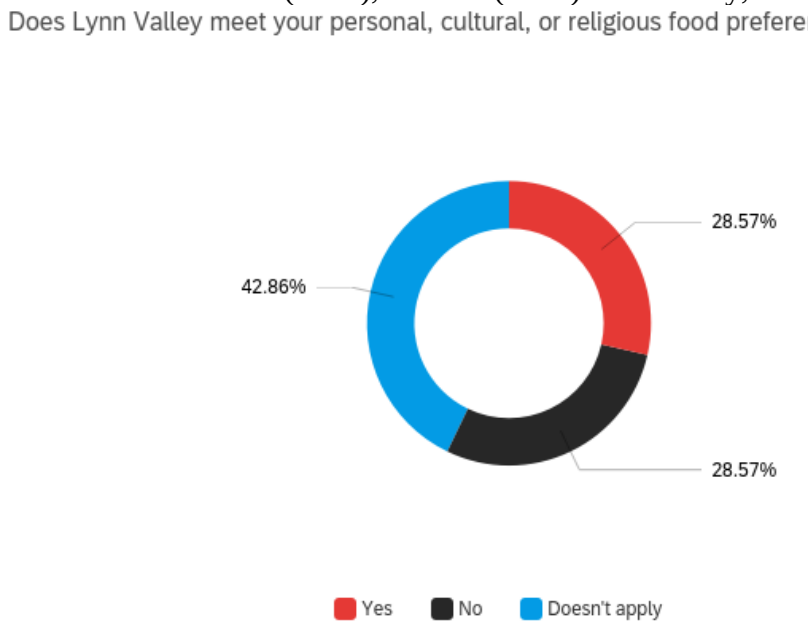

Figure 9: Participants were asked whether the food met their personal, cultural, and/or religious food preferences. 28.57% (n = 4) said yes, 28.57% (n = 4) said no, and 42.86% (n = 6) said this does not apply to them.

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Table 1: Participants were asked which food items were most and least enjoyable, and for their personal menu suggestions. The square brackets dictate the number of times items were mentioned (with no brackets referring to just once mentioned).

Most Enjoyable	**Least Enjoyable**	**Menu Suggestions**
Desserts	Chicken and meat [2] - overcooked and poor quality	Pita
Rice (note: needs soy sauce)	Deli meat	Shawarma
Squash	Eggs [4] - cold, overcooked, runny	Birthday meal choice
Fish and chips	Meat with gravy	French toast
Jello	Overcooked vegetables (potatoes, carrots, beans)	Fresh fruit (not canned) [2]
Fish [2]	Overcooked/low quality meat	Lamb
Chow mein	Cold soup	Quality mashed potatoes
Meat	Soggy toast	Shepards pie
Chicken	Burnt muffins	Good italian food
Ice cream	Pork	Asian foods
Spaghetti	Spicy foods	Veggies with dressing
Chicken pot pie	Turnips	Chef's salad
Sweet and sour pork on rice	Pasta	Spicy curry
Sandwiches	Lasagna	More meat
	Beef	Steak
	Pork	Bacon
		Fried eggs
		Wine [2]
		Ice cream
		Better salads
		Steak
		Burgers
		Chinese food [2]

B. Assessment of menu and long-term nutrition care plans.

Figure 10 displays a sample menu at Lynn Valley Care Centre. In order to determine the nutritional adequacy of the menu, a nutrient assessment is performed and the results are displayed in Table 2. It is important to note that this is the basic menu that does not include dietary modifications as per NCPs, so this menu does not reflect the intake of all clientele. Further, Figure 6 revealed that 54% of participants did not consume all of the food they were served, so this menu reflects only the available nutrients opposed to that which is consumed. A comprehensive nutrition assessment of the clients is required to determine their nutritional status, but this form of assessment is out of the scope of this report.

LVCC SUMMER MENU			OCT 24 - OCT 30 WEEK 3			
SUNDAY 24	MONDAY 25	TUESDAY 26	WEDNESDAY 27	THURSDAY 28	FRIDAY 29	SATURDAY 30
Cranberry Juice	Apple Juice	Orange Juice	Cranberry Juice	Apple Juice	Orange Juice	Cranberry Juice
Rolled Oats or Cold Cereal	Rolled Oats or Cold Cereal	Rolled Oats or Cold Cereal	Rolled Oats or Cold Cereal	Rolled Oats or Cold Cereal	Rolled Oats or Cold Cereal	Rolled Oats or Cold Cereal
Poached Egg	Scrambled Egg	Cheddar Slice	Bacon	Poached Egg	Scrambled Egg	Poached Egg
		Bran Muffin				
Raisin Toast	Whole Wheat toast	Strawberry Jam	Whole Wheat Toast	Whole Wheat Toast	Whole Wheat Toast	Whole Wheat Toast
Grape Jelly	Marmalade	Butter Cup	Marmalade	Grape Jelly	Marmalade	Strawberry Jam
Split Pea Soup	Beef Barley Soup	Cream of Broccoli Soup	Vegetable Soup	Florentine Soup	Tomato Soup	Cream of Vegetable Soup
French Toast with Syrup	Cold Meat Plate	Cheese Pizza Bun	Tuna Melt	Veggie Burger	Grilled Cheese Sandwich	Chicken Bunwich
Sausage Links	Caesar Salad	Coleslaw	Tomato & Cucumber	Garden Salad	B & B Pickle	Rainbow Garden Salad
Orange slices	Luncheon Roll		Salad	Potato Gem		
Alternate Sandwich:	*Alternate Sandwich:*	*Alternate Sandwich:*	*Alternate Sandwich:*	*Alternate Sandwich:*	*Alternate Sandwich:*	*Alternate Sandwich:*
Ham	*Tuna*	*Egg*	*Chicken*	*Salmon*	*Egg*	*Tuna*
					Blueberry Bliss	
Tropical Fruit Salad	Pineapple Tidbits	Apricot Halves	Orange Citrus Cake	Diced Pears	Ice Cream	Fruit Cocktail
Fresh Fruit	Coffee Cake	Peanut Butter Cookies	Apple Strudel	Mini Donut	Cheese&Crackers	Applesauce Cake
Roast Beef	Lemon Baked Cod	Crispy Chicken	Shephard's Pie	Tuscan Pork	Baked Salmon	Spaghetti
Gravy	Parsley Sprig	Parsley Sprig		Gravy	with Dill Sauce	with
					Lemon Wedge	Meat sauce
Mashed Potatoes	Scalloped Potatoes	Baked Yam	Bread Slice	Roasted Potatoes	Steamed Rice	Garlic Bread
Mixed Vegetables	Buttered Corn	Green Beans	Sunrise Vegetables	California Mixed Veg	Brussels Sprouts	Cauliflower with Peppers
Squash	Peas	Carrots	Broccoli	Corn	Carrots	Squash
Coconut Cream Pie	Apple Crisp	Butterscotch Pudding with Whip Topping	Fresh Fruit	Blueberry Crisp	Mango	Cheesecake Tart
**IN ORDER TO ACCOMMODATE GUESTS FOR MEALS, PLEASE GIVE US AT LEAST 2 HOURS NOTICE **						
PROTEIN OPTIONS AVAILABLE AT BREAKFAST INCLUDE: Eggs (poached, scrambled or hard boiled), peanut butter, cheese, smooth yogurts as per resident preference. OFFERED DAILY AT BREAKFAST: Assorted Fruit						
SERVED AT MEALS & SNACKS: Coffee, tea, milk, hot & cold water, orange juice, apple juice & cranberry juice.						

Figure 10: Sample summer menu at Lynn Valley Care Centre.

Using the Government of Canada nutrient profile database (Health Canada), the nutrient composition of this sample menu is determined. The mean macronutrient distribution of the menu is approximately 58.165% carbohydrates, 16.67% protein, and 25.165% fat. The Acceptable Macronutrient Distribution Range (AMDR) is 45-65% carbs, 10-35% protein, 20-35% fat (Health Canada), so the menu distribution is adequate. Macronutrient and micronutrient intake is compared to Dietary Reference Intakes (DRIs) for males and females over the age of 70 (the average age of residents at Lynn Valley Care Centre is predicted to be greater than 70, being that the age range of clientele is 60-100). It is determined that both protein and carbohydrate consumption is higher than recommended, though this is likely a strategic decision since a significant portion of the clientele is not consuming their meals in full. Though there is not a designated Upper Limit (UL) for protein, some experts suggest that intakes close to 2g/kg can begin to cause issues ("When It Comes To Protein, How Much Is Too Much? - Harvard Health"). For males and females over the age of 70, this would total to approximately 140g/d, and 115g/day, respectively. As such, even with potentially higher protein intake as a result of supplements prescribed for pressure ulcers or other needs for increased protein intake, the current mean intake of 70.67g is of little concern. Mean carbohydrate intake appears to be almost twice

the DRI for individuals over the age of 70; however, there is no UL set for carbohydrates, and considering the diet fits within the AMDR, carbohydrate intake is expected to be suitable.

For fat-soluble vitamins, Vitamin A intake is seen to be inadequate, with mean intake at a level of 594.28mcg, which is 66.03% of the DRI for males and 84.89% of the DRI for females. Vitamin A is vital to processes in vision and cellular differentiation, especially for maintaining organs such as the heart, lungs, and kidney ("Vitamin A - Fact Sheet For Health Professionals"). As such, inadequate intakes could have detrimental impacts on these processes, especially considering that the majority of clientele are not consuming the entire menu and would thus have more concerningly low intakes. Vitamin D intake was similarly seen to be inadequate, with a mean intake of 3.25mcg being 16.25% of the DRI. The role of vitamin D in bone mineralization and remodelling has crucial implications on the development of osteomalacia and osteoporosis in older adults, so adequate consumption is of utmost concern for this age group ("Vitamin D - Fact Sheet For Health Professionals"). Mean intake of vitamin E is calculated to be merely 25.80% of DRI for males and females, which is of concern due to the antioxidant roles it holds ("Vitamin E - Fact Sheet For Health Professionals"). Insufficient vitamin E intakes could result in increased risk of infection and disease, however, vitamin E deficiency is not common in the general population ("Vitamin E - Fact Sheet For Health Professionals"). Mean vitamin K intakes are recorded to be 25.11% of the DRI for males and 33.48% of the DRI for females. Inadequate intakes of vitamin K impair its function as a coenzyme in blood clotting and bone metabolism ("Vitamin K - Fact Sheet For Health Professionals"). This could be of particular concern for individuals prescribed anticoagulants (i.e. blood thinners) which may be common in LTC facilities ("Vitamin K - Fact Sheet For Health Professionals").

For water-soluble vitamins, mean intake of vitamin B5 is calculated to be 23.00% of the DRI for males and females. Vitamin B5 is necessary for the synthesis of coenzyme A and acyl carrier protein, which themselves function in a variety of anabolic and catabolic processes vital for the body ("Pantothenic Acid- Fact Sheet For Health Professionals"). The dramatically low intakes seen in the clientele suggest that these processes could be impaired. Intake of vitamin B9 is seen to be 83.90% of the DRI for males and females. Though this inadequacy is not largely significant, it could potentially cause issues regarding cell division and amino acid metabolism, while increasing the risk of megaloblastic anemia ("Folate - Fact Sheet For Health Professionals"). Mean intakes of vitamins B1, B2, B3, B6, B12, B9 and C are seen to be within 10% of the DRI and are thus considered adequate.

In terms of minerals, mean intakes of calcium are also seen to be quite low in this diet, at 46.75% of DRI for males and females. Calcium is of particular concern for this age group due to its importance in the structure of bones and teeth, with calcium deficiency increasing the risk of osteoporosis development ("Calcium - Fact Sheet For Health Professionals"). Sodium intake is difficult to measure as the menu does not report the quantity of salt being added to meals by the chef and/or clients themselves, so the mean intake is imprecise. Nonetheless, the calculated intake levels are 3.63 times higher than the DRI, and 2052 mg higher than the UL. Excessive sodium intake poses a risk for development of stroke, hypertension, and cardiovascular disease, amongst other complications, which may be of increased concern for LTC clientele as they are at a greater risk, and have potentially already encountered these ailments (Health Canada). Iron intake is assessed as adequate.

Table 2: Comparison of mean nutrient intakes to Dietary Reference Intakes.

Nutrient	**Mean intake**	**DRI (males >70 yo)**	**DRI (females >70 yo)**
Calories (kilocalories)	1776.33		
Protein (g)	70.67	56	46
Carbohydrates (g)	247.73	130	130
Fat (g)	51.03		
Vitamin A (mcg)	594.28	900	700
Vitamin D (mcg)	3.25	20	20
Thiamin B1 (mg)	1.219	1.2	1.1
Riboflavin B2 (mg)	1.381	1.3	1.1
Niacin B3 (mg)	14.839	16	14
Pantothenic acid B5 (mg)	1.160	5	5
Vitamin B6 (mg)	1.401	1.7	1.5
Vitamin B12 (mcg)	3.61	2.4	2.4
Folate B9 (mcg)	335.63	400	400
Vitamin C (mg)	103.37	90	75
Vitamin E (mg)	3.87	15	15
Vitamin K (mcg)	30.13	120	90
Calcium (mg)	560.97	1200	1200
Iron (mg)	13.29	8	8
Sodium (mg)	4352.12	1200	1200

The literature reports that LTC clients tend to consume adequate energy levels, often meeting their daily requirements for kilocalories, but are not meeting their dietary reference intakes for micronutrients (Durant). It is also seen that MTDs tend to have lower mean energy and macronutrient levels than regular diets - with an approximate difference of 450 calories and 7.0g of protein (Durant). As the MTDs do not follow the regular menu plan, they tend to be repetitive as food service staff need only prepare a few of these meals. Further, MTDs and other forms of therapeutic diets designed for LTC clients tend to be restrictive in nature. As such, this is likely to result in less diversity in therapeutic diets, which is correlated with poor diet quality (Wu et

al.). Further, oral nutritional supplementation may have a significant effect on the energy and nutrient intake of LTC clients, but their precise effect is unclear (Durant). These oral nutritional supplements, such as the Boost products that are frequently consumed at Lynn Valley Care Centre, are not included in the menu, and are instead given as necessary and/or desired, so their nutritional impact is difficult to quantify.

As nutrition assessments were not conducted for the purpose of this report, a literature review was conducted to find secondary research on the nutritional status of LTC clients. Nutritional status is an important indicator of health, and is regularly evaluated in LTC facilities through biochemical and clinical assessments. One particular clinical assessment that is of importance in LTC contexts is the Mini Nutritional Assessment (MNA), which determines if an individual is malnourished or at risk of malnourishment. In one particular study, MNA found that 32.8% of participants (LTC clients) were malnourished, while 30.5% were at risk of malnourishment (Ho et al.). Another study utilized Subjective Global Assessment to determine that 52.8% of residents were mild/moderately undernourished, while 17% were severely undernourished (Sacks et al.). These examples reveal that clientele in LTC facilities are at significantly increased risk of malnourishment. Due to age and disease incidence, much of the clientele has low appetites, as well as difficulty digesting and absorbing foods, which results in an increased prevalence of undernourishment. However, the risk of malnourishment could be mitigated in part by increasing interest in the food available to the clients. LTC facilities attempt to include client preference in menu design when it relates to specific dietary restrictions, notably those that are religion or value-based. However, they neglect to consider innate likes and dislikes, such as those seen in Table 1.

C. Assessment of culturally-relevant food practice

Culture is one of, if not the most, significant factors influencing dietary choices throughout the lifespan. Besides religious-based taboos, there are many foods favoured and avoided simply as a result of cultural habits. As a community shares their practice of obtaining food by way of regional availability and local markets, they develop a characteristic way of eating. These “cultural differences in eating attitudes and behaviours imply that an individual’s cultural orientation may influence the attitudes and behaviours” around food and eating (Orji & Mandryk). Food choices can even be seen as a symbol of one’s ethnic identity (Das & Priya). Maintaining one’s identity is an especially important component of aging, as individuals' lives begin to become less busy and potentially less fulfilling. Moreover, memory-related disorders that are correlated with age inhibit people’s ability to have a strong grasp on their identity. This strong relationship between culture and identity can thus be used as a means of maintaining a positive quality of life. This practice can be particularly useful in the context of LTC as clients are in an unfamiliar setting that may provoke their loss of self-image. Serving clients familiar and culturally-appropriate foods could serve as a reminder of positive memories and a tool for enhancing quality of life. Further, food choice behaviours are found to be an important determining factor for nutritional status and overall health (Monterrosa et al.). Food satisfaction has a notable link to happiness in seniors, with those that are completely satisfied with their diet having a more positive quality of life (Lobos et al.).

III. CONCLUSION

A. Summary and overall interpretation of findings

The results of the primary research reveal that there are some discrepancies in menu satisfaction across the clientele of Lynn Valley Care Centre. More specifically, regarding food quality (Figures 1, 2, 3) clientele is determined overall to be satisfied in taste, palatability, and temperature of cold foods, with satisfaction rates at 71.43%, 71.39%, and 64.29%, respectively. Figure 4 shows satisfaction in the availability of food, at 92.86% of clientele. Presentation of food (Figure 5) was generally regarded well, with 64.29% of clientele finding the meals visually appealing. Figures 6 and 7 show that 71.43% declared that the food was always or sometimes suitable to dietary preferences, while 64.29% stated there was always or usually an alternative option on the menu.

Areas of dissatisfaction include temperature of hot foods, with 50.0% of clientele reporting complaints. Moreover, Figure 6 also shows clientele frequently reporting that there is an excess of food at each meal, with 53.85% of clientele stating there is too much food served. In terms of whether the menu met personal, cultural, and/or religious food preferences, Figure 8 shows an equal distribution (28.57%) of agreement and disagreement, while just below half (42.86%) of clientele stated they have no relevant preferences in this area. As such, this question requires further exploration in order to determine whether bias within the participant population prevented a concrete answer from appearing, or rather if the population of Lynn Valley Care Centre is disproportionately unaffected by personal, cultural, and religious food preferences. Nonetheless, Table 1 reveals that the clientele has specific preferences that should be considered in modification of the menu.

The analysis of the nutrient composition of the sample menu at Lynn Valley Care Centre reveals that the menu offers adequacy in macronutrients, but there are some inadequacies present in the content of micronutrients. The menu contains adequate contents of vitamins B1, B2, B3, B6, B12 and C, as well as iron. In contrast, the menu is assessed to be inadequate in vitamins A, D, B5, B9, E, K, and calcium, with sodium levels exceeding the UL. As such, the content of the latter vitamins and minerals require amendment in the updated menu.

Secondary research reveals that malnutrition disproportionately impacts clientele in LTC facilities, which underscores the need for menu modification to ensure the potential for adequate nourishment. Further, increasing the cultural appropriateness and preference focus of the menu design decreases the likelihood of food insecurity and has potential opportunity for enhancing QOL.

B. Recommendations

Through determination of the opinions and personal preferences of the clientele of Lynn Valley Care Centre, appropriate recommendations can be made in order for the menu to better serve current and future clients. In order to improve client satisfaction of food temperatures, it is recommended to modify the food service practices in order for the hot foods to be served at appropriate temperatures. This could involve preparing meals in smaller batches so that food has less time to get cold. It is also important to ensure that the food is kept on the stove and/or

heating trays for as long as possible before serving, and that the meals are served immediately after being portioned, as opposed to being portioned in large batches and then waiting on serving trays. Further, as clientele repeatedly found that food was served in excess, it would be in their best interest to alter the amount of food served depending on a person's regular intake. This would also benefit the facility by reducing the amount of waste at each meal, which is likely plenty if the majority of individuals are not finishing their meals. Subsequently, in order to ensure that they are still receiving adequate nutrients, individuals who are served reduced portions on account of their intake should be given supplements, such as Boost products or specific vitamins, to supplement their intake. This process could be organized by way of the Dietary and Care Aides recording the quantities leftover at each meal, and then altering the NCPs as necessary. In order to take into account the clients' specific preferences and dislikes, it is recommended that upon admission and at each regular evaluation, the client's preference list is created and modified as necessary. The primary data collected in this report provides a suitable place to start, as the menu can be modified to include and exclude the items listed in Table 1. Though the primary research did not necessarily suggest need for amendment in terms of the cultural focus of the menu, the literature details the positive implications that incorporating a cultural focus will have on the self-identity of clientele. As such, it is recommended that the clientele be interviewed, when available for current residents and upon admission of new clientele, based on their cultural identification. Subsequently, the menu can be modified with the addition of the popular menu items from each client's culture.

Suggested ways to incorporate increased quantities of these nutrients are in Table 2, which also incorporates plant-based options to increase the sustainability of the menu. These suggestions would be best incorporated alongside those in Table 1.

Table 3: Menu suggestions for nutrients determined to be inadequate in the current menu.

Nutrient	**Foods**

Vitamin A ("Vitamin A - Fact Sheet For Consumers")	• dark leafy greens (kale, spinach, swiss chard)
	  ○ salads
	  ○ incorporated into dishes such as pot pie, quiche, scrambled eggs
	• fresh fruits (cantaloupe, apricots, mangoes)
	  ○ fruit salad at breakfast
	• fortified dairy products
	  ○ add milk to porridge
	  ○ serve milk with meals
	• fortified breakfast cereals
	  ○ switch to Post Great Grains, Special K, or Cheerios Original

Vitamin D ("Vitamin D - Fact Sheet For Consumers")	• fortified dairy products • fortified breakfast cereals • increase servings of fatty fish (trout, tuna) • bring clients outside during the warmer months for sun exposure
Vitamin B5	• eggs

("Pantothenic Acid- Fact Sheet For Consumers")	- try fried eggs - ensure proper temperature to increase intakes - quiches - mushrooms - incorporate into stir fries, shepards pie - whole grains - switch white cinnamon raisin for whole wheat cinnamon raisin - whole wheat buns - peanuts - for snacks - chickpeas - in salad - hummus as a snack
Vitamin B9 ("Folate-Fact Sheet For Consumers")	- asparagus, brussels sprouts, dark leafy greens - try to rotate local vegetables into lunch and dinner - oranges - if not in season, ensure juice is fortified with B9, vitamin C, etc - nuts - as snacks - cereal/oatmeal topping - beans - chili - fortified flour - baked goods
Vitamin E ("Vitamin E-Fact Sheet For Consumers")	- vegetable oils (sunflower, safflower) - for salad dressing, cooking - nuts - spinach - fortified breakfast cereal
Vitamin K ("Vitamin K-Fact Sheet For Consumers")	- dark leafy greens (kale, spinach, swiss chard) - vegetable oils - blueberries and figs - snacks - cereal/oatmeal topping - smoothies - soybeans - tofu in lunch/dinner meals
Calcium ("Calcium - Fact Sheet For Consumers")	- dairy - yogurt at breakfast - kale, broccoli, bok choy - calcium-fortified juice, tofu, soy beverages

Appendix (Online Survey)

https://ubc.ca1.qualtrics.com/jfe/form/SV_a5kqMK1hJvG7uuy

Satisfaction with Nutrition and Food Services Questionnaire

The author of this survey is an undergraduate student at UBC currently involved in a technical writing project. The purpose of this survey is to obtain primary data for an analysis and investigation that aims to provide recommendations for improving the menu at Lynn Valley Care Centre through the inclusion of client food preferences. The final formal report will be addressed to Lynn Valley Care Centre and CareCorp Senior Services. Together with an assessment of secondary research data concerning the implementation and evaluation of culturally diverse food practices, the data I gather from this survey will serve the ultimate purpose of providing recommendations for increasing client quality of life through food service satisfaction. The survey contains ten multiple-choice questions and three short-answer questions, and it should take about five minutes of your time. Your responses are voluntary and anonymous.

I appreciate your honest and thoughtful participation in my survey. Thank you for taking the time to complete it. Please check the box below that you are comfortable using your personal opinions for survey research.

- O I accept.
- O I do not accept.

The meals and snacks served at Lynn Valley are:

- O Always enjoyable
- O Sometimes enjoyable
- O Rarely enjoyable

Does the food taste good?

- O Yes
- O No
- O Doesn't apply

Is the food appetizing in its appearance?

- O Yes
- O No
- O Doesn't apply

Are foods meant to be hot served at an appropriate temperature?

- O Yes
- O No
- O Doesn't apply

Are foods meant to be cold served at an appropriate temperature?

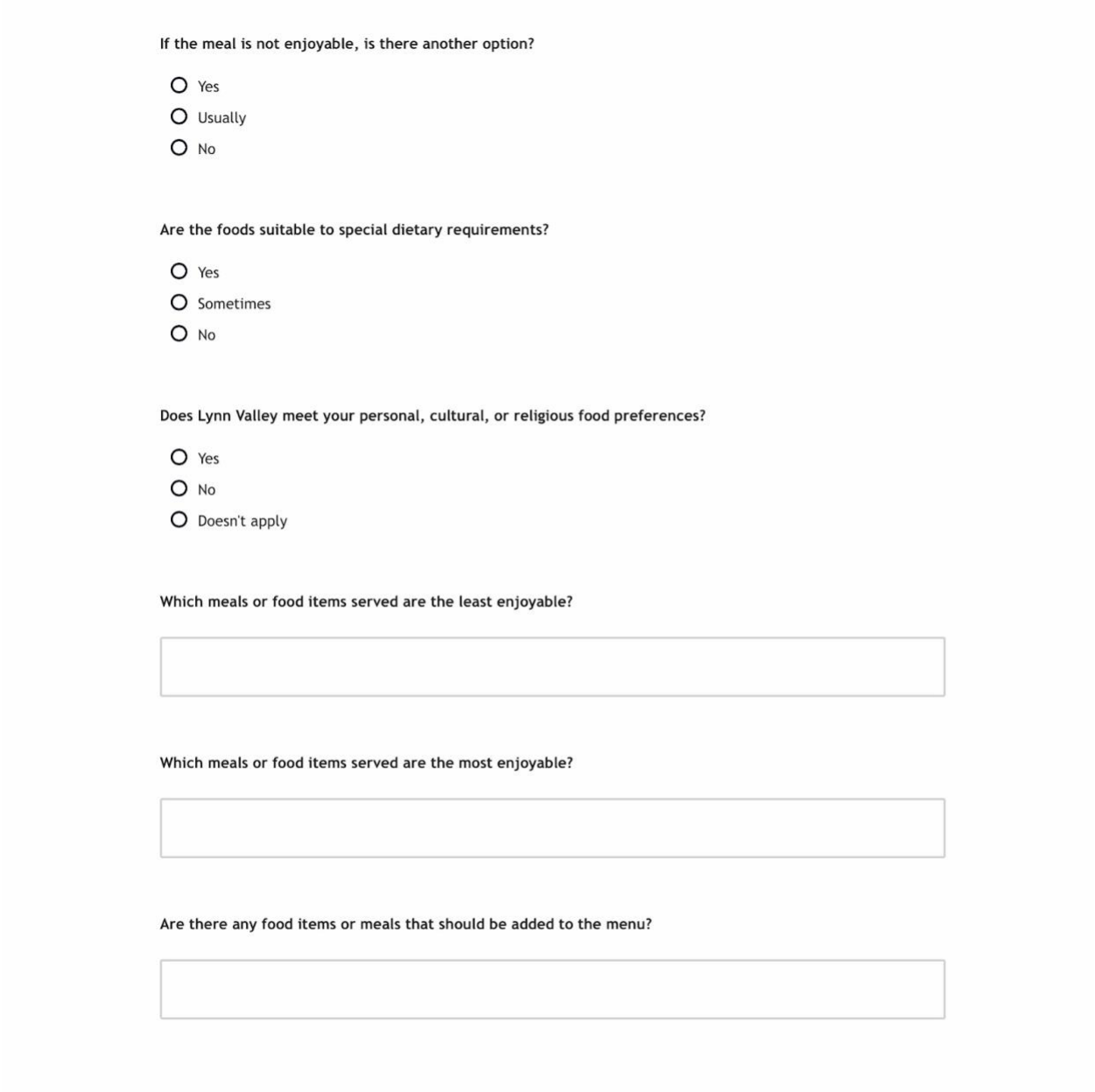
- O Yes
- O No
- O Doesn't apply

Is there enough food available, in terms of number of mealtimes and quantity served at each meal?

- O Always
- O Usually
- O Never

Do you usually eat most of the food that you receive at each meal?

- O Yes
- O No
- O Doesn't apply



If the meal is not enjoyable, is there another option?

- Yes
- Usually
- No

Are the foods suitable to special dietary requirements?

- Yes
- Sometimes
- No

Does Lynn Valley meet your personal, cultural, or religious food preferences?

- Yes
- No
- Doesn't apply

Which meals or food items served are the least enjoyable?

Which meals or food items served are the most enjoyable?

Are there any food items or meals that should be added to the menu?

Figure 1: Satisfaction with Nutrition and Food Services Questionnaire

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