

Fibre Content & Fibre Fortification of Menu Items Served to Sherbrooke Community Centre Residents on Texture Modified Diets

Hira Ghani^{1†*}, Brooke Motowylo^{1†*}, Mandy Olsen^{1†*},
Robin Hartl², Seshni Naidoo³, & Allison Cammer^{1*}

Abstract

Background: Research has shown that regular and texture modified menus in long term care homes provide less than the recommended Dietary Reference Intake for dietary fibre. Constipation may result from inadequate fibre intake and be treated with laxatives and enemas, which may have implications for quality of life. Increasing the amount of fibre provided from texture modified diets may decrease the use of such treatments and improve daily fibre intake.

Objective: This study was part of a health improvement initiative for residents at Sherbrooke Community Centre (SCC). The goal of this study was to measure the baseline amount of fibre provided to residents on texture modified diets and to increase fibre provision by 5-10 grams per day.

Methods: This study involved: 1) determining the fibre content of the texture modified menu for residents on pureed and minced diets; 2) identifying fibres and foods suitable for a fibre fortification trial; 3) conducting a fibre fortification trial and identifying fibre-food combinations for a taste test; and 4) conducting a taste test with SCC staff to assess acceptability of fibre fortified menu items. Thirty SCC staff were included.

Results: The average daily fibre provided was 13.4 grams. The fibre fortified foods best accepted by participants were mashed potatoes with red lentils, pudding with pea hull fibre, and gravy with pea hull fibre.

Implications: We recommend the SCC incorporates the best accepted fibre fortified menu items into their regular and texture modified menus, allowing the daily average amount of fibre to increase by 5.4 grams per day.

Keywords: fibre, fortification, texture modified diets, long term care, nutrition

1 College of Pharmacy and Nutrition, University of Saskatchewan, Saskatoon, SK, Canada

2 Sherbrooke Community Centre, Saskatchewan Health Authority, SK, Canada

3 Department of Nutrition & Food Services, Saskatchewan Health Authority, SK, Canada

† These authors contributed equally to this work

* Correspondence: higo53@mail.usask.ca
bmm631@mail.usask.ca
mandy.olsen@usask.ca
allison.cammer@usask.ca



Introduction

Texture modified diets including a soft, minced, or pureed diet, may be prescribed to individuals diagnosed with dysphagia (Alberta Health Services, 2015; O’Keefe, 2018; Vucea, Keller, Morrison, Duizer et al., 2018). Dysphagia is a swallowing disorder that can occur during any phase of a swallow and can be a side effect of different conditions including Parkinson’s disease, Alzheimer’s disease, stroke, and head and neck cancer (Dahl, 2017). The main concern associated with dysphagia is the risk of aspiration, which can lead to the development of aspiration pneumonia (Cichero, Lam, Steele, Hanson et al., 2017; Dahl, 2017). A texture modified diet may decrease the risk for aspiration by altering the food or fluid before ingestion, allowing for a safe swallow (Cichero et al., 2017). Although texture modified diets are implemented for safety, individuals prescribed these diets may experience nutritional inadequacies. The Making the Most of Mealtimes Study (M₃ study), conducted by comparing menus from 32 long term care (LTC) homes in Canada, found that texture modified diets, when compared to regular diets, were nutritionally inadequate (Vucea, Keller, Morrison, Duncan et al., 2017). Interestingly, the M₃ study found that neither the pureed nor the regular diets met the Dietary Reference Intake (DRI) for fibre for adults over the age of 50 (Vucea et al., 2017). Although neither met the recommended amounts for fibre intake, the pureed diets provided less dietary fibre than the regular diets included in the M₃ study (Vucea et al., 2017).

It has been estimated that the prevalence of constipation in LTC residents is up to 70% (Sturtzel, Mikultis, Gisinger, & Elmadfa, 2009). Constipation occurs when an individual experiences difficulty passing stool; this may involve straining, pain, or an incomplete passage of stool (Dahl, Whiting, Zello, & Hildebrandt, 2003). Constipation may result from reduced intakes of dietary fibre or fluid, reduced mobility, use of medications causing constipation, and can be related to an underlying disease (Dahl et al., 2003). Constipation also has implications for quality of life and may increase care required from staff (Dahl et al., 2003). Many LTC homes resort to bowel care regimens such as laxatives, enemas, and suppositories to treat constipation (Dahl & Mendoza, 2018). However, studies have shown that fibre fortification can be an effective strategy to promote laxation. A review in 2018 found that increasing daily fibre provision by 4 to 14 grams may increase the frequency of bowel movements and/or decrease the use of laxatives (Dahl et al., 2003; Dahl & Mendoza, 2018). Various fibres have been recommended to be added to foods to improve fibre content: pea hull fibre, oat bran, wheat bran, inulin, fructo-oligosaccharides (FOS), isomalto-oligosaccharide (a prebiotic), and blended fibres (Dahl et al., 2003; Dahl & Mendoza, 2018; Khaja, Thakur, Bharathan, Baccash, &

Goldenberg, 2005; Sturtzel & Elmadfa, 2008; Sturtzel et al., 2009; Yen, Tseng, Kuo, Lee, & Chen, 2011).

The goal of this study was to expand upon the current literature and provide a practical application of fibre fortification to a texture modified menu. Our study is part of an ongoing health initiative for the Sherbrooke Community Centre (SCC), a LTC home located in Saskatoon, Saskatchewan, Canada. The four phases of this study included: 1) determining the fibre content of the texture modified menu for residents on pureed and minced diets; 2) identifying fibres and foods suitable for a fibre fortification trial; 3) conducting a fibre fortification trial and identifying fibre-food combinations for a taste test with SCC staff; and 4) conducting a taste test with SCC staff to assess acceptability of fibre fortified menu items. The overall goal of this study was to increase the daily amount of fibre provided by 5-10 grams and to make recommendations regarding which fibre fortified foods may be incorporated into the texture modified menu at SCC.

Methods

The assigned case number for ethical approval was #453. Operational approval to conduct research at SCC was granted by the Saskatchewan Health Authority (SHA) Behavioural Research Ethics Board, the University of Saskatchewan Behavioural Research Ethics Board, and the SCC Ethics Board.

Participants for the taste test were sought from the staff at SCC. Participant recruitment involved developing and displaying posters for the taste test. Recruitment also involved the primary research investigator inviting SCC staff to the taste test at regularly scheduled huddles. Those with food intolerances and/or food allergies were excluded to minimize the risk of adverse food reactions. Staff not blinded to the types and amounts of fibres added to the foods being sampled were also excluded. Thirty participants were included. Prior to partaking in the taste test, participants were provided a consent form. Free and informed consent was implied with participants filling out and submitting taste test surveys.

Calculating Fibre Content of the SCC Texture Modified Menu

The fibre content of menu items served to SCC residents on minced and pureed diets was determined using a database of recipes developed for SHA facilities. Because the menu items offered at SCC are prepared with similar ingredients and in the same manner as those offered at SHA facilities, the SHA recipe database was used as an accurate estimation of the amount of fibre in foods served at SCC. Menu items served at each meal to residents on minced and pureed diets

were identified for every day of the five-week menu cycle and standard portion sizes of menu items were established. The amount of fibre provided in a standard portion size of a food or beverage was calculated for each item. The total amount of fibre provided each day of the menu cycle was calculated to determine the daily average amount of fibre provided each week and throughout the five-week rotation (see Table 1).

Table 1: Daily Average Amount of Fibre Provided Each Week and Throughout Five-Week Rotation

Week	Daily average amount of fibre (g)
1	12.6
2	13.4
3	13.0
4	13.8
5	14.0
1-5 (all)	13.4

Suitability of Foods and Fibres for Fibre Fortification Trial

Three steps were involved in determining which foods and fibres would be most suitable for fibre fortification. The first was analyzing the five-week cycle menu to determine which foods were served most frequently to residents on pureed

and minced diets. The results were used to have a discussion with SCC foodservice staff (i.e. manager, cooks, and foodservice workers) about which foods would be most suitable for fibre fortification based on resident preferences. The second step was obtaining a catalogue of fibres available for purchase by SHA facilities and consulting SCC foodservice staff about which fibres would be most suitable for fibre fortification based on previous fibre fortification trials conducted by the facility. The third step was gathering information from the literature regarding which foods and fibres have been successfully used for fibre fortification in LTC settings. Gravy, mashed potatoes, soup, and pudding were determined to be the best food options for fibre fortification. Pea hull fibre, pureed yellow split peas, pureed red lentils, oat bran, and ground flaxseed were determined to be the best fibre options for fibre fortification (see Table 2).

Fibre Fortification Trial

A fibre fortification trial was conducted with the cooks at SCC to determine which fibre-food combinations would be suitable for residents prescribed pureed and minced diets. Different types and amounts of fibres were tested in different foods (see Table 3). Fibre fortified foods were evaluated on taste, texture, and appearance to determine potential acceptability.

Table 2: Fibres Most Suitable for the Fibre Fortification Trial

	Texture	Colour	Flavour	Cost/kg ^a	Supplier	Type of fibre	Amount of dietary fibre (g)/100g
Pea hull fibre	Gritty, fine powder	Light green	None	\$7.85	Kinnikinnick Foods	75:25 Insoluble:Soluble (Dahl, Hughes, & Malcolmson, n.d.)	86.7
Pureed yellow split peas, boiled	Smooth	Light yellow	Earthy	\$3.39	Independent's Choice Distribution (ICD)	70:30 Insoluble:Soluble (Turcotte, n.d.)	8.3
Pureed red lentils, boiled	Smooth	Light orange	Peppery	\$5.71	Sysco	Soluble and Insoluble (Groppe & Smith, 2013)	4.2
Ground flaxseed	Crunch, flakey	Golden brown	Nutty	\$6.49	ICD	Insoluble and soluble (Flax Council of Canada, 2019)	27.3
Oat bran	Thick, chewy	Beige	Bland	\$2.17	Sysco	65:35 Insoluble:Soluble (Grain Millers, 2018)	10.5

^a Cost/kg from Saskatoon Health Region Food and Nutrition Catalog for items on contract (Sept. 5/2018)

Table 3: Fibre Fortification Trial

Texture modified foods	Notes on preparation, texture, flavour, and colour	Type of fibre added	Amount of fibre product added/serving	Amount of fibre provided (g)/serving ^a	Chosen for taste test?
Gravy (chicken)	Cooked roux for an additional 15 minutes to reduce gritty texture from pea hull fibre.	Pea hull fibre	1.3 g	1.13	Yes
Mashed potatoes	Red lentils added a slight chalky flavour and golden colour. Yellow split peas added a more noticeable golden colour. The texture remained smooth for both. The difference between adding 2 tbsp or 3 tbsp of fibre was insignificant for both.	Pureed red lentils	2 tbsp	1.27	No
		Pureed red lentils	3 tbsp	1.89	Yes
		Pureed yellow split peas	2 tbsp	2.30	No
		Pureed yellow split peas	3 tbsp	3.50	Yes
Soup (broth-based)	The soup adopted an oatmeal-like texture when oat bran was added. One tbsp of pea hull fibre resulted in a gritty texture. Adding smaller amounts of pea hull fibre resulted in less of a gritty texture for some and an unnoticeable gritty texture for others.	Oat bran	1 tbsp	1.50	No
		Pea hull fibre	1 tbsp	12.10	No
		Pea hull fibre	½ tbsp	6.50	Yes
		Pea hull fibre	2 tsp	8.67	No
Pudding	Ground flaxseed altered the flavour and colour of the pudding significantly. Oat bran added a flakey texture to pudding that could be considered a choking hazard for residents on texture modified diets. Pea hull fibre was easily mixed into pudding. Both ground flaxseed and oat bran required blending before being added into pudding whereas pea hull fibre did not.	Ground flaxseed	½ tsp	0.68	No
		Oat bran	1 tsp	0.53	No
		Pea hull fibre	¼ tsp	1.10	No
		Pea hull fibre	½ tsp	2.20	Yes

^a The amount of dietary fibre provided per serving was determined using the amount of fibre product added per serving and the amount of dietary fibre per 100 g of the fibre product used for fortification (see *Table 2*).

Taste Test for Fibre Fortified, Texture Modified Foods

On the day of the taste test, participants were given 5 copies of the taste test survey; one for each of the fibre-food combinations sampled. The taste test survey required participants to rank each sample as great, good, so-so, or awful on taste, texture, appearance, aroma, and overall satisfaction. Space was provided for participants to comment on each of their rankings. The taste test survey also required participants to indicate whether they would eat the sampled menu item if offered by circling one of the following: yes, no, or maybe. Although participants were aware of the foods being sampled, they were blinded to the types and amounts of fibres added.

Data Collection and Statistical Analysis

Data collected from the taste test questionnaires were entered into Microsoft Excel 2013 spreadsheets. Both quantitative and qualitative data were collected. Percentages were calculated for the number of participants who ranked the sampled menu items as *great*, *good*, *so-so*, or *awful* on taste, texture, appearance, aroma, and overall satisfaction and for the number of participants who provided *no response*. Percentages were calculated for the number of participants who responded *yes*, *no*, or *maybe* to eating the sampled menu item if offered and for the number of participants who provided *no response*. Any written comments provided were also entered into the Excel spreadsheets.

Results

Fibre Content of the SCC Texture Modified Menu

It was determined that the daily average amount of fibre provided throughout the five-week rotation was 13.4 grams. The lowest total amount of fibre provided in a day was 5 grams whereas the highest total amount of fibre provided in a day was 20 grams.

Options for the Fibre Fortification of Menu Items

With two options for the fibre fortification of mashed potatoes, the use of mashed potatoes with pureed yellow split peas versus the use of mashed potatoes with pureed red lentils affected the total amount of fibre added. If residents were to consume one serving of gravy with pea hull fibre (1.1 grams), one serving of mashed potatoes with pureed yellow split peas (3.5 grams), one serving of soup with pea hull fibre (6.5 grams), and one serving of pudding with pea hull fibre (2.2 grams) in a single day, residents would receive an additional 13.3g of fibre. Conversely, if residents were to consume one serving of mashed potatoes with pureed red lentils (1.9 grams) instead of one serving of mashed potatoes with pureed yellow split peas, while still having the other fibre fortified menu items in a single day, an additional 11.7 grams of fibre would be consumed.

Taste Testing of Fibre Fortified, Texture Modified Menu Items

Results from taste test surveys collected for each fibre fortified, texture modified menu item sampled are summarized in *Table 4* and *Figure 1*.

Discussion and Recommendations

Nutrient Analysis

Based on the nutrient analysis conducted for the texture modified menu at SCC, the daily average amount of fibre provided over the five-week menu cycle was 13.4 grams, falling below the DRI for men and women above the age of 50 (30 grams per day for men; 21 grams per day for women (Institute of Medicine, 2005)). This result is consistent with the M3 study which found that pureed and regular menus served in 32 LTC facilities across Canada did not meet the DRI for fibre (Vucea et al., 2017). Additionally, the nutrient analysis assumes that all foods offered to residents are fully consumed; yet, it has been estimated that residents living in

LTC consume on average 50 % of foods provided (as cited in Vucea et al., 2017). Therefore, residents on minced and pureed diets at SCC may consume even less than the average 13.4 grams of fibre offered per day.

Fibre Fortification

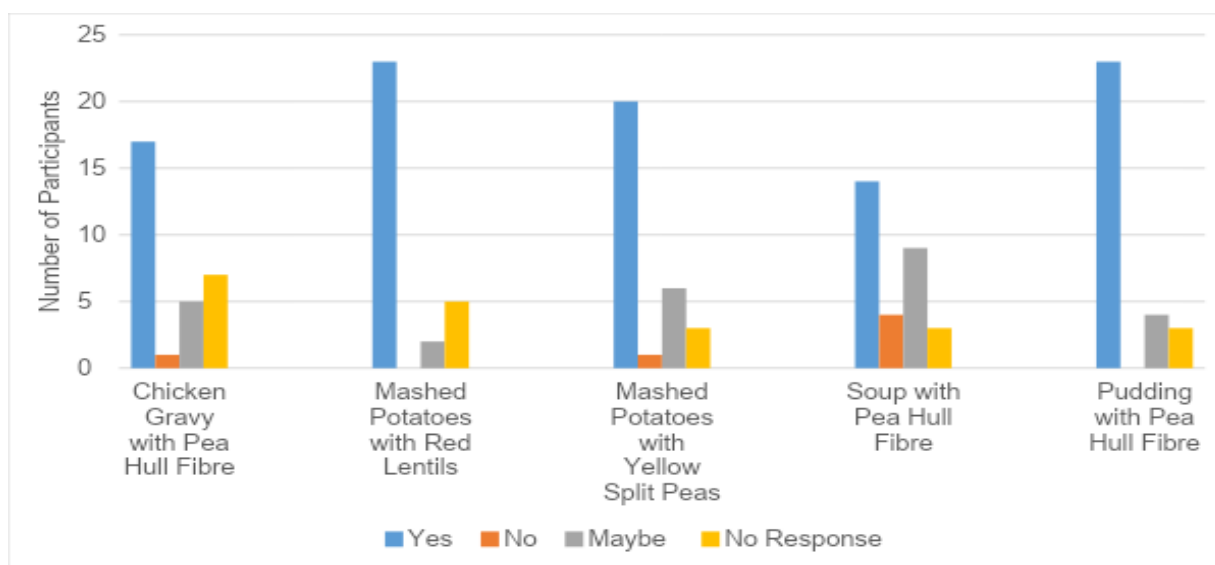
Foods served often (i.e. oatmeal, cream of wheat, soup, pudding, and mashed potatoes with gravy) were found to also be foods preferred by residents. The oatmeal and cream of wheat served at SCC are already fortified with wheat bran. As regular fibre intake throughout the day is more beneficial, the addition of fibre to foods which are already adequately fortified with wheat bran was not attempted (Dahl & Stewart, 2015). Foods chosen for the fibre fortification trial were gravy, mashed potatoes, soup, and pudding. After trialing different types of fibre in these foods, the following fibre-food combinations were chosen for taste testing: mashed potatoes with yellow split peas, mashed potatoes with red lentils, soup with pea hull fibre, gravy with pea hull fibre, and pudding with pea hull fibre.

As the mashed potatoes tested with two different types of fibres were similar in flavour, texture, and colour, both were prepared for the taste test to assess which fibre source would be most acceptable to SCC staff. Chicken and beef gravies served at SCC are already fortified with pea hull fibre; our goal was to maximize the amount of pea hull fibre added to gravies. It was predicted that the flavour, texture, and colour of a fibre product would be well-masked by soup. Previous studies have been successful in adding oat bran, a supplement called 'Fibre 7', and pea hull fibre to soups (Sturtzel & Elmadfa, 2008; Khaja, Thakur, Bharathan, Baccash, & Goldenberg, 2005; Dahl, 2005). In this study, oat bran and pea hull fibre were trialed in a broth-based soup. It was found that adding oat bran to the soup resulted in an oatmeal-like end product and a less desirable appearance in comparison to adding pea hull fibre. The pea hull fibre was well-masked in terms of appearance and flavour and provided the highest amount of fibre per serving (see *Table 3*). When trialing coarse fibre sources such as oat bran and ground flaxseed in pudding or soup, the addition of fibre was visible and altered the flavour and texture of the menu items even with further processing of the oat bran and flaxseed. In comparison to oat bran and ground flaxseed, pea hull fibre was found to be the best option for fortification. Pea hull fibre is finely ground and unflavoured, allowing it to be easily incorporated into a food product (Dahl et al., 2003), and pea hull fibre provides the highest amount of fibre per gram when compared to other fibre products (see *Table 2*). Pea hull fibre was also a readily available product and familiar to SCC cooks. However, there is a limit to the amount of pea hull fibre that can be added, as adding more can lead to a less acceptable texture.

Table 4: Participant Rankings and Participant Comments for Taste Test Parameters

Fibre-food combination	Taste test parameters	Number (n) of participant responses	Percentage (%) indicating "great"	Percentage (%) indicating "good"	Percentage (%) indicating "so-so"	Percentage (%) indicating "awful"
Chicken gravy with pea hull fibre	Taste	24	29.2	45.8	25.0	0.0
	Texture	23	56.5	39.1	4.3	0.0
	Appearance	23	69.6	30.4	0.0	0.0
	Aroma	23	34.8	47.8	17.4	0.0
	Overall	22	27.3	63.6	9.1	0.0
Participant comments: "couldn't tell [if] it was beef or chicken", "[it was] good, as a thick gravy", "too salty", "grainy", "a bit grainy but passable", "salty", "little bit of [an] after taste I can't place – didn't taste like chicken"						
Mashed potatoes with red lentils	Taste	27	33.3	66.7	0.0	0.0
	Texture	26	26.9	61.5	11.5	0.0
	Appearance	26	57.7	38.5	3.8	0.0
	Aroma	25	36.0	52.0	12.0	0.0
	Overall	24	29.2	70.8	0.0	0.0
Participant comments: "a bit gritty", "slightly darker", "thick", "a bit peppery tasting", "a little sweeter but really good", "compared to [mashed potatoes] #2 ^a , I liked this better", "this was fine but I liked the creaminess of [mashed potatoes] #2 ^a "						
Mashed potatoes with yellow split peas	Taste	29	31.0	34.5	34.5	0.0
	Texture	28	32.1	46.4	21.4	0.0
	Appearance	28	42.9	46.4	10.7	0.0
	Aroma	28	35.7	46.4	17.9	0.0
	Overall	26	30.8	53.8	15.4	0.0
Participant comments: "a bit gritty", "slightly earthy", "oh this is good", "more starch", "nice flavour", "can taste the split peas but still really good", "tastes like peas", "could taste lentil", "I like creamier mashed potatoes like this"						
Soup with pea hull fibre	Taste	29	41.4	37.9	17.2	3.4
	Texture	28	17.9	42.9	32.1	7.1
	Appearance	27	29.6	51.9	18.5	0.0
	Aroma	28	42.9	42.9	14.3	0.0
	Overall	24	37.5	45.8	12.5	4.2
Participant comments: "mushroomy, couldn't tell it was broc/cheddar", "leaves a dryness in mouth", "not much [aroma]", "too salty", "chalky", "a bit gritty", "a little pastey because it [is] also a cream soup (flour) sticks in throat", "can't tell what # soup it is", "mushroom?", "a little bit grainy but not unpleasant", "beige anything is never that appealing"						
Pudding with pea hull fibre	Taste	29	69.0	27.6	3.4	0.0
	Texture	28	71.4	28.6	0.0	0.0
	Appearance	28	75.0	21.4	3.6	0.0
	Aroma	26	69.2	26.9	3.8	0.0
	Overall	27	74.1	25.9	0.0	0.0
Participant comments: "has a bit of tang", "very good", "more pudding!", "starchy?", "not much [aroma]", "delicious", "couldn't taste at all"						

^a Mashed potatoes fortified with pureed yellow split peas.

Figure 1: Participant responses to eating fibre fortified, texture modified menu items if offered.

Taste Test

Based on findings from the taste test conducted with SCC staff, most menu items were generally well accepted. Gravy fortified with additional pea hull fibre was given a rating of *good* overall with a consensus of 63.6%. When participants were asked if they would eat the gravy if offered, 73.9% agreed. One way to strengthen these results may have been to test more than one type of gravy fortified with pea hull fibre, i.e., the original recipe and the newly modified recipe with additional pea hull fibre. This would have allowed us to determine whether modifications to the gravy altered participant ratings and to establish whether acceptability increased or decreased following these modifications.

In comparing ratings for mashed potatoes fortified with red lentils and mashed potatoes fortified with yellow split peas, both types of mashed potatoes were given an overall score of *good*. However, mashed potatoes fortified with red lentils had a stronger consensus of 70.8% compared to 53.8% for mashed potatoes fortified with yellow split peas. Additionally, when participants were asked whether they would eat either product if offered, 92.0% of participants circled *yes* for mashed potatoes with red lentils and only 74.1% circled *yes* for mashed potatoes with yellow split peas. It can be concluded that mashed potatoes fortified with red lentils were generally better accepted than those fortified with yellow split peas. However, mashed potatoes with red lentils provide two grams less of dietary fibre per serving compared to mashed potatoes with yellow split peas.

The soup prepared on the day of the taste test was a cream-based soup (i.e. broccoli cheddar), whereas a broth-based soup was used during the fibre fortification trial. As

the cream-based soup was made with flour, the addition of another powder, pea hull fibre, resulted in a grittier texture compared to when the pea hull fibre was added to a broth-based soup. The soup was rated as *good* overall with only a 45.8% consensus; however, one participant did rate this product as *awful* overall. Additionally, only 51.9% of participants expressed they would eat the soup if offered. As there was a poor consensus (less than 50%) for the overall acceptability of the product, soup fortified with pea hull fibre may not be suitable for the texture modified menu. With gravy, texture improved when pea hull fibre was cooked in water and before subsequent ingredients were added. It may have been beneficial to attempt the addition of pea hull fibre to soup while it was being prepared. Furthermore, having both cream-based and broth-based soups to sample on the day of the taste test would have allowed us to determine whether there were any differences in texture and acceptability between both soups and, subsequently, to adjust the amounts of pea hull fibre added to each.

It was found that 74.1% of participants rated the pudding as *great* overall, with a strong consensus that the pudding had *great* taste, texture, aroma, and appearance. When asked if the participants would eat the pudding if offered, 85.2% indicated *yes*. It can be concluded that pudding fortified with pea hull fibre was well accepted by participants. According to Dahl, Whiting, Zello, and Stanger, 2001, adding pea hull fibre to pudding resulted in a less acceptable product. As our study did not involve trialing menu items prior to fibre fortification, it is unclear whether the pudding would be rated as less acceptable by participants following its fortification

Recommendations

The goal of this study was to determine the baseline amount of fibre being provided to SCC residents on texture modified diets and to increase the daily fibre content of the menu by 5 to 10 grams per day. By increasing the amount of fibre provided to residents, the occurrence of constipation may decrease, which may decrease the use of laxatives or bowel care regimens. Based on previous research, fibre fortification is an effective strategy for improving laxation and has been reported to work as effectively as laxatives (Dahl & Mendoza, 2018). The amount of fibre required to increase laxation is reported to be between 4 and 14 grams (Dahl & Mendoza, 2018; Dahl, 2003). According to McRorie and McKeown, 2017, insoluble fibres have a stool bulking effect and decrease the occurrence of constipation. Fibres tested in this study are comprised of both soluble and insoluble fibres (see *Table 2*) with pea hull fibre having the highest ratio of insoluble fibre.

Not all fibre fortified menu items were generally accepted by participants. As the pudding fortified with pea hull fibre and mashed potatoes fortified with red lentils were given the highest ratings among participants, we recommend these options be added to the texture modified menu. As the gravy is already fortified with pea hull fibre, it is difficult to conclude whether increasing the amount of pea hull fibre resulted in a less acceptable end product. Our recommendation for SCC would be to continue to fortify the gravy with pea hull fibre but to be cautious of any alterations to texture and overall quality. Fortifying soup with pea hull fibre requires further investigation prior to recipe modifications. As the addition of pea hull fibre in soup would provide the largest increase in daily fibre, finding a successful amount for fortification would be an effective strategy to improve the amount of fibre offered to residents daily. With our recommendations, an additional 5.4 grams of fibre may be added to the current menu.

Since foods chosen for fortification are menu options on both the texture modified and regular menus, all recommendations outlined above may be implemented for both diets. Although the amount of fibre provided from the regular menu was not assessed, the addition of fibre fortified menu items to all diets may have implications in decreasing constipation among all residents. It should be noted that with increased fibre intake, increasing fluid is also necessary to help decrease the occurrence of constipation, as fibre holds water and increases fecal water loss (Bunn, Jimoh, Wilsher, & Hooper, 2015). Developing a hydration policy for staff members may help improve fluid intake of LTC residents. This policy should include providing beverages regularly throughout the day (Dietitians of Canada, 2013).

Limitations of Study

One of the study limitations was fortifying menu items with different types of fibres only after the menu items had been prepared, with the exception of adding pea hull fibre to gravy while it was cooking. Investigating the effect of food fortification with fibre while the food items are being prepared versus after they have been prepared may be an area of future study. Another limitation to this study involved the lack of baseline measures for taste, texture, appearance, aroma, and overall satisfaction for each texture modified menu item included in the taste test. Since acceptability was not assessed prior to fibre fortification for any of the sampled menu items, it is unclear whether foods were less acceptable to participants following fortification. Findings from this study may not be generalized to other LTC homes as this study was conducted at a small LTC site in Saskatoon, Saskatchewan. Lastly, the taste test for this study was conducted among SCC staff. Further research is necessary to determine acceptability by residents as well as to determine effectiveness of fibre fortified texture modified menu items in improving laxation and decreasing the use of laxatives and enemas.

Conclusion

As a health improvement initiative, the goal of our study was to increase the daily amount of fibre provided from the texture modified menu at SCC by 5-10 grams. It was found that the current texture modified menu provides less than the recommended amount of dietary fibre for both men and women over the age of 50. The implementation of our recommendations, which were developed based on findings from the taste test conducted with SCC staff, would increase the daily amount of fibre provided by 5.4 grams. As our research focused on the acceptability of fibre fortified texture modified menu items by SCC staff, an area for future research involves assessing resident acceptability of fibre fortified texture modified menu items. Future research may also involve determining whether fibre fortification is effective in improving laxation. For example, further research may determine whether adding fibre to texture modified foods reduces the number of residents on bowel care regimens and/or decreases laxative use. Another area of future research may involve determining how best to fortify foods with fibre as acceptability and texture were identified as potential areas for improvement in our study.

Acknowledgements

We are grateful for the assistance of the Saskatchewan Health Authority, University of Saskatchewan, and Sherbrooke Community Centre for their assistance with this research project.

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