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Measuring Consumers' Health and Outcome Benefits of Switching from Clinical Dietary Supplements to a Food First Approach

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Background and Aims

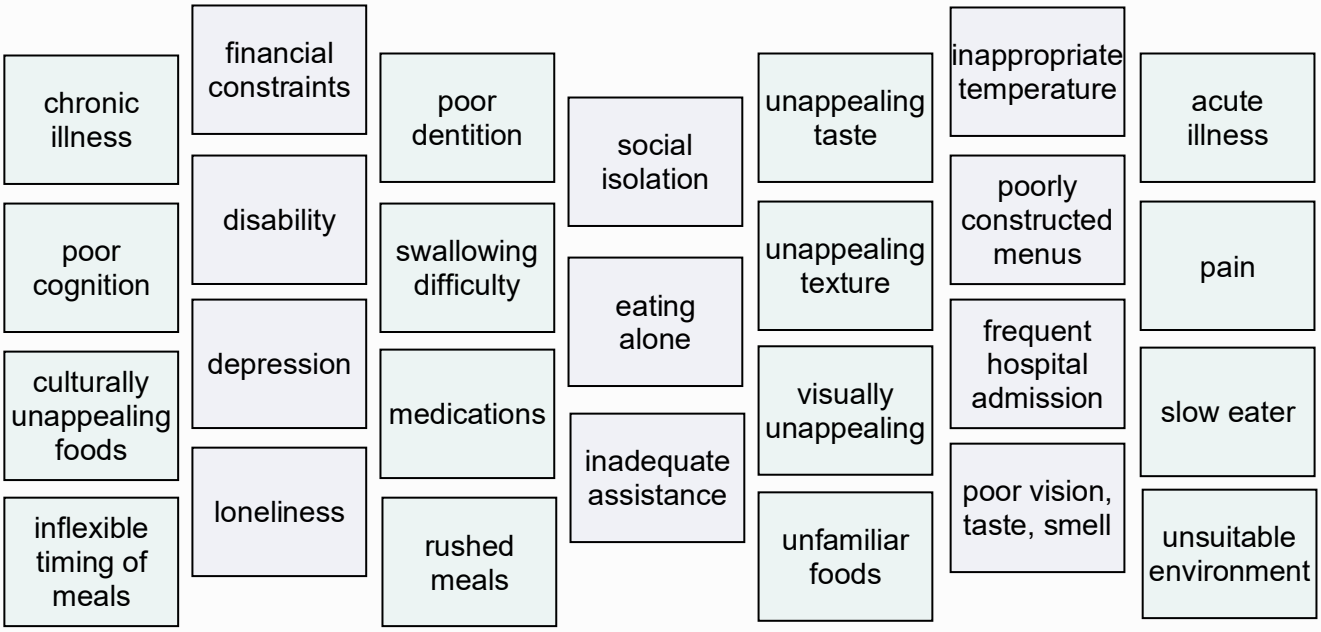
Malnutrition is highly prevalent in residential aged care homes (RACHs)[1]. Findings from the Royal Commission into Aged Care Quality and Safety indicated that 68% of residents across 60 RACHs in 2017 were diagnosed with malnutrition or at risk of malnutrition[2].

Malnutrition

- Develops from prolonged poor dietary intake that does not meet the individual's needs[3].
- It results in weight loss which reduces strength and energy levels, increasing the risk of falls and fractures in older adults[1].
- Further, malnourished individuals are at greater risk of hospital admissions and poorer recovery outcomes[3].

The aged care population is at risk of malnutrition, due to several physiological changes that coincide with aging[4-6] and environmental factors[7,8].

Malnutrition Causes



Clinical dietary supplements (CDS) are a nutrition intervention frequently used in RACHs to address malnutrition with the aim of increasing dietary intake of energy and protein.

CDS are administered in the form of a liquid supplement and routinely prescribed by a dietitian to supplement oral intake. If administered according to the regime, CDS can have positive outcomes for individuals with malnutrition, particularly in clinical settings[9].

There are several barriers that impact CDS consumption:[10,11]

Therefore, supplying CDS to residents can be ineffective and contribute to excessive wastage and economic losses. More cost-effective interventions would be favored by RACHs.

Aged care food service staff require time saving interventions to improve nutritional status of malnourished residents[12]. It is common for aged care homes to manually fortify food items, such as soups and custards[13], increasing the workload and training requirements of staff[13]. Interventions need to be feasible and should consider the perspectives of aged care food service staff.

Studies have demonstrated that enriched food products and menu items can be effective to increase energy and protein intake[14-17]. Food first interventions are well received by individuals due to improved taste, familiarity and palatability[16,18]. Fortification of a familiar dessert product, such as ice cream, can be used to replace standard ice cream, and increase energy and protein intake for malnourished individuals.

Food Imperative Frozen Dessert is an ice cream product that has been developed in collaboration with nutrition professionals to specifically address the nutritional needs of aged care residents with malnutrition, inclusive of residents with dysphagia.

The aims of this study were:

1. To determine the acceptability and tolerability of Food Imperative Frozen Dessert product compared to CDS currently used at ACH.
2. To compare the intake of Imperative frozen dessert compared to CDS within residents of ACH.
3. To explore the impact of using the frozen dessert product on resident body weight compared to standard/usual CDS.
4. To determine the feasibility of providing a high protein and energy frozen dessert in place of CDS within the food service.

Summary of Methods

The study was conducted in November 2024 and January 2025 involving aged care residents across ACH Highercombe (November) and ACH Kaparra (January). All residents provided informed written consent prior to participating and were able to withdraw at any time. Only residents who were in receipt of CDS were eligible to participate. Residents unable to provide informed consent and/or unable to fulfil the study requirements were excluded.

Participants were involved in the project for 4 weeks in total. During weeks 1 and 2 (Days 1-14), residents received their usual CDS prescription. CDS were administered in the usual format, by nursing staff during the medication rounds. Provisions and wastage/left over CDS were recorded by the nursing staff on the project data forms.

During weeks 3 and 4 (Day 15-28), participants had their CDS prescription replaced with up to 2 serves of the Food Imperative Frozen Dessert, delivered at morning and afternoon tea by ACH staff. To ensure that participants continued to receive adequate nutrition support, a modified CDS prescription was provided to residents who had a shortfall in energy and protein despite the prescription of the full 2 serves of the dessert. The ice cream provision was recorded, and the leftovers were collected and weighed by research staff to determine resident intake of the dessert.

The Food Imperative Frozen Dessert has been formulated with a unique blend of whey, caseinate and soy protein to facilitate increases in lean muscle mass, compared to individual proteins or other protein combinations. Additionally, the Food Imperative Frozen dessert is suitable for all levels of the International Dysphagia Diet Standardisation Initiative 2019 (IDSSI) 1,2 and 3[19]. Whereas standard ice cream and CDS are not suitable for IDSSI levels 1,2,3 and 4 (fluids).

To address aim 1 and 2, daily intake of both the CDS and Frozen dessert were measured each day. Participants also completed a resident food service satisfaction survey (FSS) at the end of each 2-week period and daily symptom charts were completed for tolerability. The FSS was an 11-item questionnaire with 5-levels of response, ‘none of the time’, ‘some of the time’, ‘most of the time’, ‘all of the time’ and ‘unsure’. Questions relate to the resident choice, taste/appeal, timing, appearance of staff knowledge and understanding and resident perception of health benefits. The questionnaire was administered by research staff.

To address aim 3, resident body weight was collected by ACH staff at baseline, day 15 and day 28 to determine any changes in body weight and to compare changes between the two time periods.

To address aim 4, aged care staff involved in the project were asked to complete an aged care staff food service satisfaction survey at the end of each two-week period (day 15 and day 28). The aged care worker survey was a 23-item questionnaire with the same 5-level response as the resident questionnaire. The questions relate to the workers satisfaction with the provision of CDS (day 15) or the Imperative Frozen Dessert (day 28).

FINDINGS

At the time of recruitment at each site, there were a total of 123 and 137 residents at Highercombe and Kaparra respectively. Thirty-nine residents across the two sites met eligibility and inclusion criteria and 31 residents consented to take part. Four residents withdrew from the study leaving a total of 27 participants (4 at Highercombe, 23 at Kaparra) who completed the 4-week study. Reasons for withdrawing from the study included: concerns about impact of frozen dessert on lactose intolerance, dislike of ice cream and no longer wishing to participate.

Table 1 describes the participant demographics and relevant CDS prescription details. Two-thirds of the participants were female and aged ranged from 73-101 years old. The median time that participants had resided in the aged care home was 25.5 months, ranging from 5 to 177 months and had a median time for receiving CDS of 23 weeks.

Table 1: Participant Demographic Information and CDS prescription details

	N (%)	Mean ± SD / median (IQR)	Range
Sex Male Female	9 (33.3) 18 (66.6)		
Age (years)		89.4 ± 6.8	73 - 101
Body Weight (kg) at Baseline		59.2 ± 12.8	37.4 – 84.0
Time in residence (months)		25.5 (11.5, 38)	5 - 177
Daily CDS Prescription (ml)		240 (180, 300)	120-400
Energy (kJ) Prescription from CDS		1517.4 (1335, 2520)	1012 - 3372
Protein (g) Prescription from CDS		15.1 (11.4, 25.2)	8 - 54
Time on CDS (weeks)		23 (15, 51)	8 - 52

Daily intake of CDS and the frozen dessert was recorded and is presented as a percentage of prescribed amount consumed due to the differing prescriptions across residents. Table 2 shows the percentage intakes and the total satisfaction scores for the two time periods.

Table 2: Percentage intake of CDS and Imperative Frozen Dessert along with total food service satisfaction scores of aged care residents.

	CDS	Imperative Frozen Desert	P Value
Median (IQR) Intake (% prescription)	98.8 (89.7, 99.9)	65.5 (32.1, 81.72)	0.005
Mean (SD Total Satisfaction Score (%)	54.4 (13.8)	78.9 (12.6)	<0.001

There were significant differences between the % intake of CDS and the dessert, with intake of CDS being higher. This amounted to 995kJ additional energy and 8g additional protein consumption on average from the CDS compared with the dessert. However, the mean total satisfaction scores were significantly higher for the frozen dessert compared with the CDS. When patterns of intake of CDS and Frozen Imperative Dessert were explored, there were no clear patterns within the time periods or between the two time periods.

A statistically significant negative correlation was observed between % CDS intake and % satisfaction (r – 0.470, p=0.04), whereas no significant correlation was observed between frozen dessert intake and % satisfaction scores (r 0.291, p=0.385).

Aim 3 of the study was to examine the impact of using the frozen dessert instead of the CDS on resident body weight. Table 3 shows the body weight data for residents at the 3 timepoints. Overall, there was no significant difference in mean body weight across the 4 weeks of the study. Comparing the use of the frozen dessert compared to the CDS found no significant difference in the mean weight change between baseline and day 15 vs between day 15 and 28.

Table 3: Change in mean participant body weight, and the mean change in weight at baseline, day 15 and day 28.

	Weight range	Mean SD	Mean weight change
Baseline	37.4 – 84.0	59.2 (12.8)	
Day 15	37.4 - 87.9	59.4 (13.2)	0.19 ±1.74
Day 28	37.8 – 85.2	60.1 (13.6)	0.75 ± 1.9
P value		0.053^	0.356#

^ no statistical change in mean body weight across the 4 weeks according to Friedman test. # no statistical difference in the weight change between CDS time period and Imperative Frozen Dessert period as determined by paired samples t-test.

The final aim of the study was to determine the feasibility of providing a high protein and energy frozen dessert in place of CDS within the food service. Four responses were received from staff however three of these were from members of the research team who were involved in delivery of the intervention hence not valid. With only one response we are unable to address aim 4 with any clarity or certainty.

Discussion

This study provides useful pilot data for any further research that may be undertaken in this context. The key finding was that while residents reported increased satisfaction with the dessert compared to CDS, they consumed a lower proportion of the prescribed amount compared to CDS. Despite the lower consumption, there was seemingly no impact on weight change over the two weeks.

Some explanatory factors for these findings might include:

- Other dietary intake may have been impacted by the consumption of the dessert, that is, intake of other food increased compared to when administered CDS, and this accounted for an equivalent total energy and protein intake overall; and/or
- The time period for which the comparison was made was insufficient to observe the true impact on body weight.

Other learnings from this study were plentiful and will be useful for design and implementation of future research. Some key learnings included:

- Workforce engagement of interventions involving food services and systems is critical and sufficient training, capacity and equipment is required to implement an intervention of this kind;
- Observations of total dietary intake is important to be able to explain the overall impact of differences in intake of the interventions;
- Weight change, while a sensitive indicator of nutritional status, is subject to variability from external factors including equipment calibration, timing and technique of measurement and overall hydration.

These findings do provide preliminary evidence that a food first approach through a dessert could be more acceptable to residents however caution is needed given the following factors:

- A longer duration to assess true impact of replacing CDS with a dessert is needed;
- A greater sample size is needed to overcome the variability in the outcome measure;
- There is a need to overcome workforce and workplace challenges that impact on the alternative method of prescribing energy and protein.

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