

Snack Time at UBC: A Nutrition Assessment of the The Acadia's Snack Program

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Snack Time at UBC:

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Executive Summary: Acadia Child Care Centre

The Acadia is one of twenty-five Childcare Centres situated on the Point Grey campus currently operated by University of British Columbia. There are a total of 5 staff members (4 early childhood educators; 1 senior supervisor) and 25 children (3-5 years of age) at this location. The objective of this case study was to determine the overall nutritional adequacy of the snacks provided by the daycare centre and the impact of daycare staff knowledge and behaviors through the use of both dietary (two direct observations sessions of snack time) and ecological assessment methods (self-reported questionnaire for daycare staff).

Questionnaire results indicated that staff placed a great emphasis on nutritional value when choosing snacks for children. However, observations revealed inconsistencies regarding portion control. In addition, the children were served processed snacks alongside healthier options (vegetables), leading to a perceived reduction in interest towards the healthier options, as the children needed to be coaxed to eat the vegetables. Through the questionnaire result, time allocation for preparing the snack is not an issue as staffs usually take approximately 15-30 minutes each day. There is a general awareness of providing healthier snacks to the children by the staff; however, budget is a factor when making snack purchases.

The children at Acadia come from relatively educated and affluent families with adequate access to safe and sufficient amounts of food. The children are generally healthy and did not exhibit any signs of undernutrition. Based on these observations, we concluded that no nutrient deficiencies were present in the children. However, we have suggestions for how the snack program could be improved.

Our first proposed intervention is based on improving the nutritional value of the snacks. Staff indicated that they already avoid providing high sugar and fat snacks. Thus, we suggest

choosing low sodium and whole grain options when available. A diet low in sodium and high in whole grains have been associated with a reduced risk of chronic diet-related diseases.

Our second proposed intervention would involve altering staff behavior. As communal snacks were served, staff did not have complete control over each child's intake, creating the possibility of over- and under-consumption. We suggest snacks be pre-portioned to avoid this. Furthermore, processed snacks and healthier options were served at the same time, and children exhibited less interest in the healthier options as a result. In the future, healthier options could be served first to encourage their consumption.

Introduction and Background

The University of British Columbia (UBC) Childcare Centre currently operates 25 locations on the Point Grey Campus (The University of British Columbia, n.d.). Based on the requests of the children's program manager, the objective of this case study was to determine the overall nutritional adequacy of the snacks provided by the daycare centre and the impact of daycare staff knowledge and behaviors. Assessment of child care nutrition is important because children may consume up to two-thirds of their total food intake at childcare facilities (Martyniuk et al., 2016). Based on our assessment, interventions will be provided to improve the snack program if necessary.

The population examined in this study was a group of 25 3-5 year old children (males and females) who currently attend the Acadia daycare centre. Due to its location, majority of the parents are either students, staff, or faculty members of UBC. There are a total of 5 staff members (4 early childhood educators; 1 senior supervisor) at this location. Key stakeholders include the children, their parents and the daycare staff. The snacks provided to the children are completely determined by the staff.

Nutrition assessments were conducted through dietary (direct observations) and ecological methods (self-reported questionnaire for daycare staff). There are two snack sessions during daycare hours (8am-5:30pm); observations were conducted during the afternoon session (3-4pm). Two assessments were made approximately one week apart. The first assessment, made on a Wednesday, was a flexible snack day, meaning the snack items were not predetermined and the children participated in snack preparation. The second assessment was made on the following Thursday, which was a non-flexible day.

Nutrition Care Process

Nutrition Assessment

Dietary Assessment

A weekly snack menu is created by staff and used for 4 months at a time (Figure 1). With the exception of the flex day snacks, the same snacks are served each week. The menu reflected the recommendations made by Canada's Food Guide to "serve small nutritious meals and snacks each day" (Health Canada, 2011).

Acadia Snack Menu

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	milk fruit cereal	milk Fruit Yoghurt	milk fruit egg	milk fruit toast or bagles	milk fruit baking or Pancakes
PM	fruit/veg with tortilla chips and dip (hummus, salsa, blacken or Avocado)	fruit/veg trail mix	Pasta Salad or Chilli	fruit/veg tortilla wraps or toast/bun/roll or sandwiches	fruit/veg Smoothies or rice cakes/cookies and Pickles Cheese

Figure 1: Photo of Acadia snack menu.

Wednesday observations: Staff first served Goldfish crackers and carrot sticks to the children on communal plates. Consequently, each child consumed a different amount of each type of snack. Children exhibited greater preference for the Goldfish crackers; they finished the Goldfish very quickly and had to be coaxed to eat the carrots. Applesauce was prepared by staff and children, but not all the children consumed the applesauce as they left the daycare before it was served. Remaining children were given approximately 90mL of applesauce, and additional servings were provided when asked. The children were also given an average of 6 Premium Plus salted crackers each. However, the crackers were distributed on demand by the three different staff members present (each staff served 2 crackers each time). The children appeared to have enjoyed the snacks; they were smiling, eating eagerly and only a small subset did not finish their applesauce. Children had individual water bottles, but very few children were observed drinking from them and staff did not encourage this behavior. None of the snacks provided were organic.

Thursday observations: Each child was first given a Quaker Crispy Minis White Cheddar rice cake and 2 small cubes of Armstrong medium cheddar cheese, apple, orange, and banana. Most children asked for and received additional servings. Similar to our previous observations, the children appeared to have enjoyed the snacks, consuming the snacks quickly and happily. More children were observed to be drinking water during this observation session compared to the previous session and staff were observed to encourage this behavior. The snacks for this session did not reflect the set weekly menu shown in Figure 1. None of the provided snacks were organic.

Ecological Assessment

To assess the nutritional knowledge and behavior of the daycare staff, a self-reported questionnaire was administered (Appendix A); 4 out of 5 staff completed the questionnaire.

Questionnaire results indicated that all staff had completed a nutrition course at the postsecondary level but only one had received Food Safe certification. Staff plan the snack menu ahead of time collectively and take turns to prepare the snacks each day (approximately 15-30 minutes per day). Nutrition was found to be greater factor in snack selection and preparation for the children rather than for staff themselves. Some staff reported that their ethnic background and daily eating patterns influenced the snacks prepared. Moreover, staff indicated that while there is no set budget for snacks, they did not want to spend too much on food purchases. Staff avoided providing snacks high in sugar and fat and indicated that they believed the snacks to be nutritionally adequate. Fruit and vegetables were incorporated into the menu everyday. Aside from water, beverages included milk or juice, and all staff also reported that they encouraged children to drink water throughout the day. However, staff reported that less than 33% of the snacks were organic and no emphasis was placed on providing whole grain snacks.

Nutrition Diagnosis

The children at the Acadia are from relatively affluent, educated families with adequate access to safe and sufficient food. Children were generally healthy; they did not exhibit any physical difficulties eating or signs that an underlying illnesses may be causing undernourishment by impeding absorption or increasing nutrient needs. Thus, it is unlikely that any of the children are suffering from a nutrient deficiency. The children are completely reliant on staff to select and provide snacks, highlighting the important role of staff knowledge and behavior in ensuring children are adequately nourished. That being said, the selected snacks and inconsistencies in staff behavior, which includes lack of portion control and times snacks were given, indicate that improvements could be made in the Acadia's snack program to increase the children's nutrient status.

PES Statement: Sub-optimal child nutrition related to daycare staff nutrition knowledge and behavior as evidenced by the selection of snacks with low nutritional value, lack of portion control, and order in which snacks were served¹.

Nutrition Intervention

Based upon our assessment, we have identified two possible nutrition interventions to address sub-optimal child nutrition.

The first intervention would be to improve the nutritional quality of the snacks being served. Questionnaire results indicate that staff are already making a conscious effort to avoid high sugar and fat snacks (Appendix B). Thus, we suggest that staff could also serve low sodium or whole grain options when possible. For instance, the children were served an average of 6 Premium Plus Salted Top Crackers. Whilst low in saturated fat and cholesterol, this serving size provides 180mg of sodium (Appendix C). This is 18% and 15% of the daily recommended intake value of sodium for children ages 1-3 and 4-8, respectively (Otten et al., 2006). Combined with other snacks served, such as Goldfish crackers, it is possible that the children have a high sodium intake, as processed foods have been identified as a major source of sodium (Samuel et al., 2014). High sodium intakes have been linked to an increased risk for hypertension, cardiovascular disease, stroke and renal disease (Mulder, Zibrik & Innis, 2011). By serving Premium Plus Unsalted Crackers instead, sodium intake will be reduced by approximately 81mg (MyFitnessPal, n.d.). Premium Plus Unsalted Crackers are available for the same price at both Save on Foods and Real Canadian Superstore, the supermarkets of choice for the childcare centre (Appendix D). Thus, switching to the low sodium option will not have a significant impact upon food budget or inconvenience to the day care.

¹ Due to the nature of our case study, there is no true nutrition problem observed. Thus, our problem is the fact the provided snacks could be of better nutritional value.

The second intervention involves altering staff behaviors to ensure portion control and to encourage healthy eating habits among children. It was observed that there were no set portion sizes for communal snacks; some children grabbed fistfuls of Goldfish crackers, whilst others only had one or two crackers. Thus, we suggest that snacks be portioned out equally to ensure children have consistent nutrient intakes and avoid over- and under-consumption. The communal snacks were served at the same time and the children showed a strong preference for the crackers. We recommend that the carrots (or any vegetable) be served first to encourage consumption. Studies have indicated that repeated exposure to healthy foods may increase one's preference for such foods, and childcare meals and snacks are one of the best times to develop these food preferences (Martyniuk et al., 2016).

The expected outcomes of the interventions would be improved child nutrient status through the consumption of snacks of higher nutritional value and consistent serving sizes. A positive change in the children's attitudes towards healthy foods may also be observed. Better childhood nutrient status will positively affect physical and cognitive development (Kurpad, Edward & Aeberli, 2013).

Nutrition Monitoring and Evaluation

To monitor the progress of the interventions, a second round of observations and questionnaires would be administered. To determine if the intervention was effective, we would specifically observe for any changes in the snacks provided (are low sodium and whole grain options being provided?) and how the snacks are being served (are vegetables being served first? Are snacks being served in individual portions?). Our second questionnaire would contain similar questions to the first questionnaire to allow for comparisons in staff behavior and attitudes pre- and post-intervention. Specifically, we would observe if more staff responded

‘Always’ or ‘Most of the time’ when asked if whole grains are incorporated into the snacks. We would also include new questions regarding 1) whether low sodium options chosen when possible, 2) how snacks are portioned and served, 3) if staff believe that the children receive equal amounts of snacks, and 4) if staff observe any children over- or under-consuming snacks.

If no or little changes in behavior are observed, different interventions must be proposed to achieve the desired health outcomes. For instance, a list of healthy, nutrient-dense snacks could be compiled and given to the staff to use for menu planning and shopping. Furthermore, the staff could purchase pre-portioned snacks instead of bulk snacks to ensure equal portion sizes. However, pre-portioned products are typically more expensive and consequently may not fit into the daycare food budget.

Summary

Based upon our assessment, whilst there are no nutrient deficiencies in the children attending the Acadia, there are areas in which the snack program could be improved to ensure better nutrient statuses in children. A strength of our study lies in the fact that we were able to directly observe snack sessions and not solely rely on self-reported questionnaires, eliminating the possibility of phantom or missing foods, and allowing for identification of any inconsistencies between staff behavior and questionnaire responses. This increases the validity of our results. However, due to time constraints, we were only able to assess two afternoon snack sessions. In addition, we did not have the means to do a complete assessment of the energy and nutrient profile of the snacks provided. Therefore, our observations may not be an accurate representation of Acadia's snack program. Future research could include more extensive assessments of both the morning and afternoon snack sessions to increase accuracy. Furthermore, we observed inconsistencies between staff behavior and questionnaire results. Despite the staff

reporting that they frequently encouraged children to drink water, we rarely observed such behaviors. Due to the negative health consequences associated with insufficient water consumption, it would be worthwhile to conduct future research analyzing the children's water intake and related staff behavior (Kant, Graubard & Atchison, 2009).

Recommendation to Stakeholders

Whilst staff indicated that there is no set budget, they did not want to spend too much on snacks. Thus, we acknowledge that budget may be a limiting factor. One of the ways that UBC Childcare can overcome this barrier is through intra-departmental collaboration within the UBC community. We recommend researching a possible liaison with the UBC farm to increase access to more seasonal/affordable fruits and vegetables. In addition, because UBC Farm is on campus, it will also serve as an excellent place for the children to learn where their snacks come from.

Critical Questions

- 1. What are other possible assessment methods that can be used to more accurately assess the Acadia's snack program?**

To more accurately determine the nutrient adequacy of the Acadia's snack program, a weighed food record could be used. As exact measurements are known, this assessment method would allow for us to accurately determine the total energy (kilocalories) and nutrient profile (macronutrient and micronutrient breakdown) of the snacks provided. In addition, if a multiple-day food record is used, the data would be more representative of usual intake than the data we collected through direct observation of two snack sessions.

- 2. Research bias occurs when a “systematic error [is] introduced into sampling or testing by selecting or encouraging one outcome or answer over others”(Panucci & Wilkins, 2010). What are ways of preventing and/or reducing observer bias within the context of observation research of daycare afternoon snacks?**

One of the methods that can be employed to prevent or reduce observer bias is to utilize an impartial third party to conduct the observations. Because this third person is does not have any vested interest in the study, they would simply be recording what they saw.

Another method that can be used is to ensure that the survey questions are worded in a neutral manner. Thus, guiding questions should be avoided as these may prompt staff to respond in a certain way. For example instead of asking staff “are whole grains incorporated into the snacks?” and “does the daycare make a conscious effort to avoid snacks high in sugar and fat?”, we could simply ask the staff to list all criteria they consider when choosing snacks for the children.

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Appendix A: Questionnaire

Nutrition Questionnaire for Child Care Staff

Circle one answer or fill in the blanks or check all that apply. Please answer all questions to the best of your ability; if a question is not applicable, write N/A.

1. Have you received any education in nutrition? Yes / No
2. If yes, please indicate the type of education you received.
 - a. High school course
 - b. Continuing education/workshop/certification
 - c. Undergraduate
 - i. Individual course(s): _____
 - ii. Degree: _____
 - d. Professional degree: _____
 - e. Other: _____
3. What is your job title/role at the daycare centre? _____
4. Do you hold a current Food Safety Certification? Yes / No
5. On a scale of 1-10 (10 being important), how important is nutrition when making food for yourself? _____
6. On a scale of 1-10 (10 being important), how important is nutrition when making food for children? _____
7. On a scale of 1-10 (10 being always), how often do you encourage children to drink water? _____

8. What beverages are provided to the children? Check all that apply.

water

milk

juice

pop

other (please specify below) _____

9. Are snacks prepared on the day of, day before or earlier? _____

10. Approximately how long does it usually take to prepare a snack?

<15 mins / 15-30 mins / >30 mins

11. What do you do with any leftover food? _____

12. Who usually prepares the snacks? _____

13. If you play a role in preparing the snacks, on a scale of 1-10 (10 equal to having very big influence), how much does your ethnic background and dietary patterns influence what kind of snacks you decide to prepare? _____

14. Is there a budget for food? Yes / No

If yes, what is it? _____

Who determines this budget? _____

15. Where does the food for the snacks come from? Please check all that apply.

local grocery store

wholesale (ex. Costco)

designated food supplier (ex. Sysco)

other (please specify) _____

16. Who usually buys this food? _____

17. Who usually plans the snacks? _____

18. On a scale of 1-10 (10 being very nutritious), how nutritious do you think the provided snacks are? _____

19. Are whole grains incorporated into the snacks? Always / Sometimes / Never

20. Roughly what percentage of the snacks are organic? <33% / 33-67% / >67%

21. Does the daycare make a conscious effort to avoid snacks high in sugar? Yes / No

22. Does the daycare make a conscious effort to avoid snacks high in fat? Yes / No

23. How often are fruits and vegetables served as part of a snack?

Once per week / 2-3 times per week / 3-5 times per week / More than 5 times per week

Appendix B: Questionnaire results

Nutrition for Questionnaire for Child Care Staff Summary (n=4)

(*denotes side notes/comments made on questionnaire)

	YES	NO
1. Have you received any education in nutrition?	4	0

2. If yes, please indicate the type of education you received	High School Course	Continuing Ed*	Undergraduate **
	0	3	1

* General Nutrition

** Individual Course: During ECE Basic / Infant Toddler - Nutrition/Safety/Nutrition Subject

3. What is your job title/role at the daycare centre?	Early Childhood Educator	Senior Supervisor
	3	1

4. Do you hold a current Food Safety Certification?	Yes	No	Did Not Answer
	1	2	1

5. On a scale of 1-10, (10 being important), how important is nutrition when making food for yourself?	6 to 7	9	10
	1	2	1

6. On a scale of 1-10, (10 being important), how important is nutrition when making food for children?	10
	4

7. On a scale of 1-10, (10 being always) how often do you encourage children to drink water?	8 to 9	10
	1	3

8. What beverages are provided to the children?	Water	Milk	Juice	Pop	Other
	4	4	1	0	0

9. Are snacks prepared on the day of, day before, or earlier?	Day Of
	4

10. Approximately how long does it usually take to prepare a snack?	< 15 mins	15-30 mins	> 30mins
	2	2	0

11. What do you do with leftover food?	Refrigerate; Goes in the Compost; Wrap, date, and save; Freeze; Discard
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12. Who usually prepares the snacks?	Any staff; take turns
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13. If you play a role in preparing snacks, on a scale of 1 - 10 (10 equal to having a very big influence) how much does your ethnic background and dietary patterns influence what kind of snacks you decide and prepare?	2	4	8	10
	1	1	1	1

14. Is there a budget for food?	Yes*	No	No Answer
	2	1	1

* Senior Supervisor: "Kind of, there is a no limit, but I don't want to spend too much for food"

15. Where does the food for the snacks come from?	Local Grocery Store*	Wholesale (i.e., Costco)
	4	1

* Save on Food, Superstore

16. Who usually buys this food?	Online order and delivery; In person by staff; Order from Save On Foods
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17. Who usually plans the snacks?	Collective planning by staff
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18. On a scale of 1-10 (10 being very nutritious), how nutritious do you think the provided snacks are?	5	8	9	10
	1	1	1	1

19. Are whole grains incorporated into the snacks?	Always	Most of the time	Sometimes	Never
	1	1	2	0

20. Roughly what percentage of the snacks are organic?	< 33%	33-67%	>67%
	4	0	0

21. Does the daycare make a conscious effort to avoid snacks high in sugar?	Yes	No
	4	0

22. Does the daycare make a conscious effort to avoid snacks high in fat?	Yes	No
	4	0

23. How often are fruits and vegetables served as part of a snack?	More than 5 times per week*
	4

* Fruits - every morning; Vegetables - every afternoon

Appendix C: Premium Plus Salted Tops Crackers Nutrition Facts Table



Appendix D: Premium Plus Salted and Unsalted Tops Cracker Prices

