





# Systematic observation of healthy eating environments in after-school services: a cross-sectional study

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## Abstract

**Objectives:** Few studies have examined the healthy eating environments within the Australian out of school hours care (OSHC) setting. This study aims to describe healthy eating environments, consisting of: (a) the alignment of provided food and beverages to Australian Dietary Guidelines; (b) healthy eating promotion practices; (c) nutrition education through cooking experiences; (d) staff role modelling healthy eating and (e) regular water availability.

**Design:** A cross-sectional study was conducted using direct observations and the validated System for Observing Staff Promotion of Activity and Nutrition (SOSPAN) tool.

**Setting:** OSHC located in urban and semi-rural regions of NSW, Australia.

**Participants:** Staff (151) and children (1549) attending twelve OSHC services operating in the hours after school.

**Results:** Fifty per cent (50%) of services offered fruits and 100% offered water as a part of the afternoon snack on all four observation days. Discretionary foods were offered on more days compared to vegetables (+1.9/d,  $P=0.009$ ), lean meats (+2.7/d,  $P=0.004$ ) and wholegrains (+2.8/d,  $P=0.002$ ). Staff promoted healthy eating on 15% of days, sat and ate with children 52%, consumed high sugar drinks 15% and ate discretionary foods in front of children 8% of days, respectively. No opportunities for cooking or nutrition education were observed.

**Conclusion:** Afternoon snacks regularly contained fruits and water. Opportunities exist to improve the frequency by which vegetables, wholegrains and lean meats are offered in addition to staff healthy eating promotion behaviours. Future research is warranted to further explore healthy eating behaviours, practices and policies within the after-school sector.

**Keywords**  
Healthy eating  
Snack  
After-school programme  
Nutrition  
Health promotion  
Behaviour

Australian children, aged 5–12 years, are consuming inadequate amounts of vegetables, wholegrains, dairy and lean meats<sup>(1)</sup>, yet they far exceed the recommended amounts of discretionary foods, which are energy-dense and often high in added sugars, saturated fats or Na. Creating supportive environments within education and care settings may be critical for establishing and promoting positive health behaviours in children. In Australia, more than 450 000 children, aged 5–12 years, attend out of school hours care (OSHC) each year<sup>(2)</sup>; it is the second largest childcare

setting, which increased in enrolments by 28% between 2014 and 2018<sup>(3)</sup>. OSHC provides care on weekdays before (06:30–08:30) and after school (15:00–18:00) and vacation care programmes (07:00–18:00) during school holidays. OSHC offers breakfast and an afternoon snack as part of their services. Healthy eating environments and the quality of the foods and beverages offered within OSHC is regulated by the Australian Children's Education and Care Quality Authority under the National Quality Framework (NQF)<sup>(4)</sup>.

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The NQF and its seven National Quality Standards (NQS) exist to improve the quality and consistency of care provided in childcare services nationally<sup>(4)</sup>. NQS comprise of a set of best practice standards that Early Childhood Education and Care services must work towards in order to meet the requirements of the NQF. As described within Quality Area 2, Element 2.1.3 of the NQS<sup>(5)</sup>, OSHC services might promote healthy eating environments via a number of ways which may consist of: providing foods and beverages consistent with the Australian Dietary Guidelines; engaging children in experiences and conversations that promote healthy and balanced lifestyles; using cooking experiences to educate children in nutrition; sitting with children during mealtimes and modelling healthy eating and nutrition practices; and providing regular drinking water.

Few studies have reported on the foods and beverages provided to children or the staff promotion practices within the Australian OSHC, and none have been published since the implementation of the NQF in 2012. Studies conducted prior to 2004 described OSHC to regularly offer discretionary food and beverages (e.g. cakes, biscuits, chips, pastries, cordial and soft drink) and limited opportunities for fruits or vegetables and few opportunities for staff nutrition training<sup>(6,7)</sup>. Despite the limited Australian research, numerous studies conducted in after-school programmes in the USA also reported less than optimal food environments during the after-school time period<sup>(8–12)</sup>. These studies found that after-school programmes frequently offered discretionary foods (e.g. desserts, salty snacks and sugar-sweetened beverages), limited access to fruits or vegetables and rarely observed staff engaging in healthy eating promotion practices<sup>(8–10,12)</sup>.

The frequent availability of energy-dense snacks within this setting is concerning due to their associated risk with weight gain<sup>(13)</sup>. The quality of foods available to children after school is important as they are often hungry during the afternoon<sup>(14,15)</sup> and are more likely to choose palatable food options<sup>(16)</sup>. As snacks between meals can contribute up to 25 % of a child's daily energy intake<sup>(17)</sup>, understanding the types of foods and beverages offered within OSHC is important, especially in the after-school time period.

OSHC is a fast-growing childcare setting. As OSHC continues to grow, it has the potential to reach a large number of children. As limited research has been published within OSHC since the implementation of the NQF, it is essential to understand the current food environments within this setting. This study, therefore, aimed to describe the healthy eating environments within a sample of OSHC services operating in the hours after school in NSW, Australia, by observing if: (a) provided foods and beverages were consistent with the Australian Dietary Guidelines; (b) healthy eating was promoted to children; (c) cooking was used to educate children in nutrition; (d) staff role modelled healthy eating practices and (e) water was regularly offered to children.

## Methods

### *Study design, sampling and ethics*

A cross-sectional study was undertaken in partnership with a not-for-profit community-owned, child education care and recreation provider. The total number of OSHC programmes operated by the organisation operating between 15:00 and 18:00 h, which provided care to primary school-aged children (5–12 years), led by employed carers, and offering afternoon tea (herein referred to as a 'snack') to attending children were eligible to participate in this study. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist<sup>(8)</sup> was used to guide the reporting of this observational study.

Written informed consent was obtained from the Director of each participating OSHC service. Due to the observational nature of the research, an opt-out approach was applied for staff and children. All parents, guardians and staff were notified of the study internally by their OSHC director. Further to this, the study was advertised via posters, information sheets and opt-out forms that were situated at all entries, exits, sign-in/out stations and notice boards, within each service for a minimum of 2 weeks prior to the data collection period. All parents, guardians, children and staff had the opportunity to opt out at any point of the research.

### *Data collection procedures*

Each OSHC was visited on four occasions by two data collectors. To reduce the risk of changes to usual practice, visits were unscheduled and completed over non-consecutive weeks<sup>(8,9)</sup> between April and August 2017.

The physical locations in which the programmes operated were coded as school, community centre, fitness centre, church, long-day care facility or other<sup>(18)</sup>. Food preparation areas (i.e. kitchens) available to the services were inductively coded as a small kitchenette (a sink and refrigerator with limited bench space and food storage), medium (sink, refrigerator, microwave, bench space and food storage), large (full kitchen: sink, refrigerator, microwave, oven, stove, dishwasher, bench space and food storage) or as a school canteen (a large, industrial kitchen area with facilities to support food preparation for a primary school).

Food and beverages offered by the OSHC were recorded each day via direct observation by the trained data collectors. The observations provided an estimation of the food groups *offered* to children, rather than the amount of foods *consumed* by the children. Labels, branding, packaging and serving style were systematically observed and recorded following a standardised protocol<sup>(8,10)</sup>. If cups of water or water stations were available to the children, then it was noted that water was available<sup>(10,12)</sup>. Foods and beverages were categorised as discretionary items according to the Australian Health Survey food classification system<sup>(19)</sup>, the Australian



Dietary Guidelines<sup>(20)</sup> and the discretionary food flags supporting the AUSNUT 2011–2013 food composition database. In brief, discretionary foods have been defined by the Australian Dietary Guidelines as those foods ‘*not necessary for a healthy diet*’ and may be consumed ‘*sometimes and in small amounts*’ as they are often high in salt, added sugar and saturated fats. Examples of discretionary foods consist of sweet biscuits (cookies), cakes, desserts (ice cream), processed meats, chocolate, savoury pastries and pies, fried foods, potato chips/crisps and/or salty/fatty snack foods, butter and spreads, soft drinks and cordials, and sports and energy drinks<sup>(20,21)</sup>.

Staff healthy eating promotion behaviours were observed and documented during mealtimes. Behaviours documented consisted of: (a) promoting healthy eating (via the use of positive language of healthy food choices, encouraging children to taste and try fruits and vegetables); (b) discouraging healthy eating (via the use of negative language of healthy food choices, discouraging children to taste and try fruits and vegetables); (c) nutrition education (leading interactive food games, cooking experiences or conversation and activities that promote a deeper understanding of how to make healthier food choices); (d) staff sitting and eating with the children (during the snack times) and (e) providing children with opportunities to distribute the food (serving food) and giving children the responsibility to clean up after their snack time. Serving styles were coded as: (a) individual portions (set portions for each child, usually served by the staff) or (b) family-style (children serving themselves from a common bowl or platter).

Activities and staff promotion behaviours that occurred outside of the designated snack times were captured using the System for Observing Staff Promotion of Activity and Nutrition (SOSPAN) tool<sup>(8,22)</sup>. SOSPAN is a systematic observation tool which captures contextual programme information and time allocations to different activities. Two data collectors systematically rotated through all areas of the service that were actively used by children and staff, completing five SOSPAN scans before rotating to the next area<sup>(9,23)</sup>. Systematic observations were continuously completed throughout the afternoon between 15:00 and 18:00 h, or until there were less than five children attending the OSHC<sup>(9)</sup>.

Activities were coded as enrichment, academic, snack, nutrition education or physical activity. For the purpose of this paper, only nutrition-related activities are presented. Activities were coded as ‘snack’ when children were allowed to consume foods provided by the programme. Nutrition education was coded as moments dedicated to discussing, teaching or playing games associated with educating children about nutrition or the benefits of healthy eating.

The SOSPAN tool systematically captured staff role modelling behaviours including the occurrences of food and beverage consumption during the programme. Foods consumed by the staff were coded as: provided (if

staff consumed programme provided foods), fruit/vegetables, sweets (sugar-based processed foods, i.e. cakes, lollies and chocolates), salty foods (chips and savoury biscuits), dairy (yoghurt and cheese), dips (hummus), fast foods (McDonalds or KFC) and other (home-made foods, not able to distinguish). Beverages consumed by the staff were coded as: coloured drinks, fast-food cups (branded labels such as McDonalds or Coca-Cola), water, coffee/tea and indistinguishable (coded if the container was non-transparent and the beverage could not be identified).

### **Observation training and System for Observing Staff Promotion of Activity and Nutrition reliability**

Five trained data collectors completed all observations. Data collectors were trained over a 3-d period, using a combination of classroom simulation and field practice by experienced senior personnel (GW), prior to the study commencement. All food, packaging, labels and food preparation areas were photographed for validity checking during analysis. Data collectors were required to meet >80% interrater reliability via an interval-by-interval agreement on two consecutive days prior to data collection. Reliability scans were collected on each data collection day, with a minimum of 30% of scans used to calculate reliability<sup>(24)</sup>. Interrater reliability was calculated using percentage agreement and Cohen’s  $\kappa$ <sup>(25)</sup>. The median percentage agreement was 93% and a  $\kappa$  of 0.93 (ranging from 0.80 to 0.97).

### **Data analysis**

Data analysis was conducted using SPSS software (version 24, IBM Corp.). Foods offered were categorised into five food groups of the Australian Dietary Guidelines: fruit, vegetables, lean meats, dairy and wholegrains as well as additional sub-categories for all grains (refined inclusive) and discretionary food items. Descriptive statistics were conducted for the number of observation days each of the food groups were observed at each OSHC. Shapiro–Wilk tests indicated that the food data were not normally distributed. The Wilcoxon signed-rank test was used to explore if discretionary food items were offered more frequently than the five food groups. Staff healthy eating promotion behaviours were presented as frequency, percentage, mean and standard deviation, and median and interquartile range (IQR) of days observed.

### **Results**

Across the 12 OSHC services and 48 observation days, children (1549) and staff members (151) were observed. OSHC services were located within metropolitan ( $n$  11) and semi-rural ( $n$  1) areas and had approved places for an average of 64 children at each service (ranging from 48 to 120



children). A total of 4688 SOSSPAN scans were completed across the observation period. Children and staff may have been observed on more than one occasion. All OSHC served an afternoon snack as a part of their daily programme and each OSHC, except one, had access to an onsite food preparation area, including a small kitchenette ( $n\ 4$ ), full kitchen ( $n\ 4$ ) or school canteen ( $n\ 3$ ).

### **Food and beverages**

Discretionary items and fruits were the most frequently offered food groups with six of twelve OSHC offering these on all four observation days. Grains were offered, on all four observation days, by four services, and dairy by two services. No OSHC offered vegetables, wholegrain options or lean meats and their alternatives on all four observation days. There were significant differences between the number of days that discretionary foods were offered compared to foods from the five food groups: vegetables (+1.9/d,  $P=0.009$ ), lean meats (+2.7/d,  $P=0.004$ ) and wholegrain options (+2.8/d,  $P=0.002$ ) (Table 1).

The most frequently observed foods offered from each of the five food groups consisted of: (a) fruits: apples (67%), oranges (40%) and pears (29%); (b) dairy: cheese (40%), milk (10%) and yoghurt (4%); (c) grains: white bread (23%), pasta (9%) and rice crackers (4%); (d) vegetables: carrot (10%), celery (4%) and cucumber (4%); and (e) lean meats and their alternatives: baked beans (2%), beef strips (2%) and hummus (2%). The most frequently observed discretionary foods included salty crackers/biscuits (31%), processed meats (27%) and confectionary foods (17%) (e.g. honey/jam/sprinkles).

Fruit platters were the most commonly observed snack option, often served alongside cooked foods (pasta), sandwiches (primarily a sugar-based topping such as honey/jam/sprinkles or processed meat with cheese and cucumber and grated carrot) or cooked discretionary foods (chicken nuggets, sausages sandwiches, hot dogs or sausage rolls). Other foods that were frequently observed included savoury platters (salty crackers/biscuits, cheese and/or dips) or fruits served with dairy products such as yoghurt or custard. Generally, the snacks were most commonly served in a family-style (platter) manner on 69% of observation days.

Water was provided on all observation days; no sugar-sweetened beverages (cordial, soft drinks or energy drinks) were observed and flavoured milk (Milo, the Fe-fortified chocolate powder) was offered on 4% of observation days.

### **Staff promotion behaviour**

Table 2 reports the healthy eating promotion practices of staff and children that were observed by the data collectors. At least one staff member was observed to sit with the children on twenty-five (52%) observation days, across eleven OSHC services. No service had a staff member sitting with children on all four observation days. The staff verbally

promoted healthy eating (encouraging children to wash their hands or select healthy snack foods) on seven (15%) observation days, across five OSHC services. No staff verbally discouraged children of healthy eating practices or choices. There were no instances of nutrition education activities provided by staff or engaging children in conversations about healthy eating. During snack times, at least one staff member consumed the provided food on fourteen (29%) observation days, across ten OSHC services. Staff were observed to consume discretionary foods (cakes, chips or fast foods) in front of the children on ten (21%) observation days, across five OSHC services. At least one staff member consumed discretionary drinks (cordial, Coca-cola, Redbull, Fanta) in front of the children on seven (15%) observation days, across four OSHC services.

Children had opportunities in food-based learning activities, such as food preparation (washing, chopping or preparing food) on three (6%) observation days at two services, food distribution (allowing children to serve their peers) on fourteen (29%) observation days at eight services and cleaning up after their snack (taking plates to the sink or having designated washing up buckets) on eleven (23%) observation days across seven OSHC services.

### **Discussion**

This study observed that foods provided to children during OSHC after school are partly consistent with the Australian Dietary Guidelines. Fruit, discretionary items and grain options were the most commonly observed food groups offered as part of the afternoon snack. Discretionary food items were provided on more observation days than vegetable, lean meat and wholegrain options. Water was the main beverage provided on all observation days, and no service offered children sugar-sweetened beverages. Instances of staff healthy eating promotion behaviours (e.g. food preparation and cooking) were limited, and staff were not observed to provide nutrition education to children. On occasion, staff modelled less than appropriate food choices by consuming discretionary food items and beverages.

OSHC in Australia are guided by the NQF to provide healthy environments for children. As stated within the NQS (Quality Area 2, Element 2.1.3), food and beverages provided by OSHC services should be consistent with the Australian Dietary Guidelines<sup>(5)</sup>. Although fruits and water were observed to be offered almost daily, vegetables were less frequently observed. These findings align with the Australian Health Survey (2017–2018 results), which indicate that almost 78% of children (aged 4–8 years) met their daily recommended serves of fruit, while only 4% met their recommended vegetable intakes<sup>(26)</sup>. Consuming a wide variety of vegetables is vital for optimal health, growth and development of children. Vegetables provide essential dietary fibre, vitamins, and minerals



**Table 1** Food provided for afternoon snack, categorised into food groups aligned with the Australian Dietary Guidelines, as observed across four observation days in twelve out of school hours care services

Food group	Mean	SD	Median	Mode	% of days programme offerings	n‡	Wilcoxon signed-rank*
Fruits†	2.9	1.4	3.5	4.0	50 %	6	<i>P</i> = 0.733
Vegetables‡	1.2	0.8	1.0	2.0	0 %	0	<i>P</i> = 0.009
Lean meats§	0.4	0.7	0.0	0.0	0 %	0	<i>P</i> = 0.004
Dairy	2.1	1.2	2.0	1.0	17 %	2	<i>P</i> = 0.062
Wholegrains¶	0.3	0.5	0.0	0.0	0 %	0	<i>P</i> = 0.002
Grains**	2.3	1.4	2.5	1.0	33 %	4	<i>P</i> = 0.242
Discretionary††	3.1	1.1	3.5	4.0	50 %	6	(ref)

\*Wilcoxon signed-rank tests the mean number of observed days each food group was offered, compared to discretionary food group.

†Includes all fresh, frozen and canned in natural juice (not syrup). Excludes dried fruit and fruit juices.

‡Includes vegetables that are fresh, frozen, cooked or canned.

§Includes fish, eggs, lean meat and poultry, nuts, seeds, legumes and beans.

||Includes milk, cheese, yoghurt, milk alternatives (Ca-fortified alternatives). Excludes cream, sour cream, dairy desserts or iced confectionary.

¶Includes grains that are categorised as wholegrain (rye, barley, bulgur, spelt, millet, quinoa and maize).

\*\*Includes all grains, bread, cereals, rice, pasta, noodles, including wholegrain options.

††Includes butter, cream, sweet biscuits, cakes, pastries, pies, processed meat, pizza, fried foods, potato chips or savoury crackers >1800 kJ/100 g, jam/honey, sugar-sweetened beverages and lollies/candy.

‡‡Food groups on all four observation days.

and are protective against weight gain and many chronic diseases (e.g. CVD and some cancers)<sup>(27)</sup>. Furthermore, the Australian Dietary Guidelines recommend that discretionary foods should be limited, only eaten sometimes and in small quantities<sup>(27)</sup>. We expected to see a portion of foods offered within the discretionary foods category; however, discretionary items were offered on more than half of the observation days. This is concerning as Australian children (aged 5–12 years) already receive more than one-third (38 %) of their total daily energy from discretionary foods<sup>(28)</sup>.

Our findings differ from those in a similar study conducted in the USA. OSHC services in our current study served fruits, vegetables, dairy products and water more frequently than after-school programmes in the USA<sup>(8)</sup>. The current study also observed fewer instances of salty snacks, dessert foods and sugar-sweetened beverages than in the USA. In a recent study by Helmick *et al.* (2019)<sup>(29)</sup>, after-school programmes in the USA identified daily barriers to serving perishable foods, such as fruits and vegetables, were attributed to cost, food preparation and food storage availability. In the current sample, all but one service had onsite access to at least basic food preparation areas, including refrigeration, bench space and storage units that aided in safely storing fresh foods. Conversely, after-school programmes in the USA served more wholegrain foods, unflavoured milk and fewer sugar-sweetened cereals<sup>(8)</sup> than in our sample. Differences in the wholegrain offerings may be attributed to recommendations in healthy eating standards on packaged snack foods between Australia and the USA. Helmick *et al.* (2019)<sup>(29)</sup> reported regularly observing highly processed pre-packaged 'muesli bar' type foods that met healthy eating standards in the USA (with added wholegrains and controlled portion sizes)<sup>(29)</sup>; however, in Australia, these same products are often categorised as discretionary foods based on their added sugar and fat content<sup>(30)</sup>.

Similarly, in an earlier study conducted in south-eastern Sydney (Australia), Sangster *et al.* (2004)<sup>(7)</sup> reported the

afternoon snack observed from forty-one programmes. The most notable difference in foods and beverages offered between these two studies was the reduction of sugar-sweetened beverages (cordial or soft drinks) recorded. Sangster *et al.* reported that 46 % of programmes offered a sugar-sweetened beverages on at least one observation day, whereas, no such beverages were reported within this study, with the primary beverage being water and occasionally milk. Further, the proportion of programmes offering fruits daily increased from 44 % to 50 %. These positive findings could be attributed to a variety of national and state changes that have been implemented since the aforementioned study was published, such as the NQF in 2012. Additional healthy eating campaigns implemented in NSW schools since this time consist of Crunch & Sip<sup>(31)</sup> or the NSW Healthy School Canteens Strategy<sup>(32)</sup> (both of which promote the daily consumption of whole fruit, vegetables and water within primary schools), as well as the state-wide sugar-sweetened drink ban in all NSW Department of Education Schools<sup>(32)</sup> implemented in 2007. However, there was not an overall increase in the five core food groups seen between these two NSW studies. There appears to be no changes in the proportion of services that offered dairy foods, with both Sangster *et al.*<sup>(7)</sup> and the current findings reporting only 17 % of services offering dairy foods or their alternatives on all observation days. As only 21 % of children (4–8 years) and almost 50 % (9–12 years) under-consume the recommended serves of dairy each day, OSHC may play an important role in assisting children meet their recommended daily intakes<sup>(1)</sup>.

Our findings indicate that the proportion of services who offered grains (cereal-based) and moderate sources of Fe every day reduced from 39 % to 25 % and from 20 % to 0 %, respectively. Reasons for these differences may be related to changes in the types of foods offered for afternoon tea within these programmes. Sandwiches or crackers were the most frequently observed foods reported by Sangster *et al.*<sup>(7)</sup> in comparison to fruit platters within this

**Table 2** Healthy eating promotion practices of staff and children observed across four observation days at twelve out of school hours care (OSHC) services

Healthy eating promotion practice	Days behaviour was observed, <i>n</i> (n 48)		Services behaviour was observed on all four observation days (n 12)	Services behaviour was observed on at least one observation day (n 12)	Days behaviour was observed, mean (n 4)		Days behaviour was observed, median (n 4)		IQR
		%				SD			
Fruits available	36	75	6	12	2.9	1.4	3.5	2	
Vegetables available	14	29	0	9	1.2	0.8	1	1	
Water available	48	100	12	12	4.0	0	4	0	
Served wholegrain options (when grains were offered)	4	8	0	4	0.1	0.3	0	0	
No sugar-sweetened beverages offered	48	100	12	12	4.0	0	4	0	
Days at least one staff verbally promoted healthy eating	7	15	0	5	0.6	0.8	0	1	
Days at least one staff verbally discouraged healthy eating	0	0	0	0	0	0	0	0	
Days at least one staff sat with children during the mealtimes	25	52	0	11	2.1	0.9	2	1	
Days at least one staff ate discretionary foods	10	21	0	6	0.8	1.0	0.5	1.3	
Days at least one staff drank discretionary beverages	7	15	0	5	0.6	0.9	0	1	
Days at least one staff delivered healthy eating education	0	0	0	0	0	0	0	0	
Days at least one staff engaged children in cooking experiences	0	0	0	0	0	0	0	0	
Days snack was served family-style (platters)	16	33	1	7	1.3	1.4	1	2	
Days children helped to prepare food	3	6	0	3	0.3	0.6	0	0	
Days children distributed food	14	29	1	8	1.2	1.3	1	1	
Days children were asked to clean up after the meal	11	23	0	7	0.9	0.9	1	2	

study. Moreover, the criteria used to establish 'moderate sources of iron' were broad in the Sangster *et al.*<sup>(7)</sup> study with no specific mention of *lean meats* as well as the inclusion of Milo (the Fe-fortified chocolate powder) and dried fruits. Although meats were not infrequently observed within this study, they were often highly processed (chicken nuggets, sausages, hot dogs or sausage rolls) and categorised overall as discretionary items<sup>(33)</sup>. No services within the current study offered lean meats or alternatives on all observation days. Positive healthy eating environments, including the foods available to children and the behaviours modelled by staff, play an important role in the types of foods children chose to eat<sup>(16,34)</sup>. Establishing good food behaviours and healthy eating knowledge in childhood is important as food practices developed in childhood flow into adolescence and adulthood<sup>(35)</sup>.

Staff have the opportunity to model positive food behaviours through sitting with children during mealtimes,

discussing and promoting healthy eating, consuming healthy foods in front of children and providing food in a family-style manner (allowing children to choose foods according to their hunger cues)<sup>(36)</sup>. Our findings indicate that, although staff were sitting with the children and providing snacks in a family-style manner, there was limited discussion about healthy eating and on no occasion were staff seen to educate the children about nutrition or healthy foods. Staff occasionally consumed less appropriate foods and drinks in front of the children during the snack times or while they were supervising activities. These results highlight an important gap in providing positive, healthy eating environments for children. These findings differed from the Sangster *et al.* (2004) study which observed staff sitting less with children during mealtimes yet reported more instances of healthy eating promotion and engaging children in the food preparation activities<sup>(7)</sup>. It is, however, unclear what criteria were used in their categorisation of healthy eating promotion and food preparation activities and, therefore, these findings should be



compared with caution. Staff within our study were observed to sit and eat with children nearly twice as frequently than in a similar US study<sup>(8)</sup>. The reasons for this might be related to standards found within the NQS (Quality Area 2, Element 2.1.3), stating that staff might be observed 'sitting with children and modelling, implementing and reinforcing healthy eating and nutrition practices with children during mealtimes'<sup>(5)</sup>. Moreover, the NQS address the importance of children learning about healthy lifestyles (including nutrition), by complimenting children's understanding of nutrition with experiences of cooking<sup>(5)</sup>. Experiential learning strategies, such as cooking, have been associated with increased fruit and vegetable consumption and energy intake reduction in primary school-aged children<sup>(37)</sup> making cooking a powerful option for improving healthy eating patterns throughout a child's life. Although there were some instances of small groups (two or three children) involved in food preparation (washing food or displaying prepared food on platters), food distribution and clean-up activities, there were no observed instances of cooking experiences nor nutrition education. Potential reasons for this may be due to the staff preparing all foods prior to children's arrival and commencing each days' programmes with the afternoon snack, between 15:00 and 15:15 and the potential risks (health and safety) associated with children preparing foods. This may explain why the children were more frequently observed engaging in food distribution (serving food) or cleaning up after the meal, as these were the only food preparation activities available to engage children. Further investigation should be conducted to better understand the reasons for the lack of nutrition education or cooking experiences and how these could be better incorporated within Australian OSHC services.

This study has a number of limitations. The foods observed can only provide an estimation of the food groups offered, rather than foods consumed by the children. The Australian Dietary Guidelines recommend the types of foods Australians should be consuming over an entire day; however, this study only captured foods provided at a single mid-meal occasion during a portion of the day. Regardless, services need to be consistent with the Dietary Guidelines and, therefore, the food provided should be reflective of the recommendations found within the guidelines. Only twelve services from one organisation located in the Illawarra region of NSW were invited to participate in this study. While this does demonstrate the feasibility of the observational methods used, all services had similar programmes, including access to the same nutrition policy. Results cannot be extrapolated to the wider OSHC sector within NSW. Although this is not a representative sample of current services in NSW, these findings show consistent trends with previous studies conducted in both the USA and in NSW. Further investigation should be conducted into the healthy eating environments within the larger out of school hours environment in NSW and Australia.

These exploratory findings suggest that services may need to offer more vegetables and wholegrain food options

and fewer discretionary items, engage children in conversations about nutrition and healthy eating, implement specific policies around the types of foods and beverages to be consumed by staff, and engage children in hands on food preparation and cooking opportunities. As the demand for care increases, promoting compliance with the Australian Dietary Guideline and NQF in OSHC has the potential to promote healthier lifestyles and equip young children to make better food choices in later life.

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## Supplementary material

For supplementary material accompanying this paper visit <https://doi.org/10.1017/S1368980021003220>

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