The cost of sustainability in higher education: staff and student views of a campus food culture

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Abstract

Purpose – This study aims to investigate the sustainability of the food culture at Deakin University and to determine what the barriers to increasing the sustainability of food on the Burwood campus may be.

Design/methodology/approach – An online survey of staff and students from the Faculty of Health at the Burwood campus of Deakin University ($n = 697$) was undertaken. The survey included questions relating to eating habits on campus, views on the current food culture, food security, food disposal, visions for the future and demographic information. In addition, a short paper-based survey was developed for the ten food outlets on campus.

Findings – The results show that although sustainability considerations are important to staff and students, cost is the main issue and is a significant barrier to the development of a more sustainable food culture. It is also a significant barrier to staff and students making healthy choices when it comes to the purchase of food on campus. However, sustainable food initiatives such as community gardens could help alleviate this barrier and also contribute to improving student engagement.

Research limitations/implications – The online survey was limited to the Faculty of Health, and, therefore, a potential bias exists towards individuals who may have an interest in health. This should be considered when interpreting the results.

Originality/value – This research demonstrates that although cost may be a barrier to universities improving the sustainability of their food culture, there are other ways in which universities can create an environment that embraces sustainable food production to benefit both the environment and the university community.

Keywords Cost, Sustainability, Higher education, Food culture, Local food procurement

Paper type Research paper

Introduction

The production and consumption of food has far reaching impacts that affect all facets of society, including the environmental, individual and public health (Reisch *et al.*, 2013) and social justice (Raynolds, 2012). The way in which food is produced and distributed directly contributes to a range of environmental problems including climate change (Smith and Gregory, 2013), water pollution, water scarcity (UN-Water, 2007), loss of soil fertility and erosion (Pimentel and Burgess, 2013) and reduction in biodiversity (Brussaard *et al.*, 2010). Food consumption is also intrinsically linked to health, and currently, 795 million people globally suffer from hunger or an under consumption of food (Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development and World Food Programme, 2015). Concurrently, in most industrialised countries, 1 to 1.5 billion people are overweight and diet- and lifestyle-related diseases such as diabetes and

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cardiovascular diseases are on the rise, even appearing in young age groups (Commission of the European Communities, 2007), which significantly increases the burden on the health system (Colagiuri *et al.*, 2010). In addition, social injustice in the global food system is a major issue with exploitation occurring throughout the agri-food system (Allen, 2008). In response to this issue, the fair trade movement arose to contribute to sustainable development by ensuring better trading conditions and working to secure the rights of marginalised producers and workers (World Fair Trade Organization, 2014).

Increasingly, more and more people are starting to consider such impacts when purchasing food. For example, consumers are becoming more and more health conscious, with the global sales of health and wellness products predicted to reach a record high of US $1tn by 2017 (Hudson, 2012), and the demand for fair trade goods is also increasing (Raynolds, 2012). Consumers have also become more concerned about the environmental credentials of their food in recent decades, illustrated by the sharp rise in the availability of food produced from alternative agricultural practices and local distribution practices such as farmers markets (Pelletier *et al.*, 2013). The increase in farmers markets in recent times across industrialised countries certainly demonstrates the growing interest in supporting a sustainable food system. As an example, in Australia, the number of farmers markets more than doubled between 2004 and 2011 (Er *et al.*, 2012).

Consumer research has shown that young people may be more willing than older individuals to pay extra for sustainable goods (The Nielson Company, 2015). However, as more than two thirds of Australian university students are worried about their finances (Bexley *et al.*, 2013), the willingness of this cohort to spend extra on products with greater environmental credentials may be questionable.

There is growing understanding that universities can play an important role, and indeed serve as a leader, in the shift towards a more sustainable society (Klein, 2014; Orme and Dooris, 2010; Ralph and Stubbs, 2014). It has been suggested that "[. . .] it is important to recognise the potential that higher education has to involve and support its massive student population in more local sustainable food economies" (Orme and Dooris, 2010, p. 432). It appears that this suggestion has not gone unheeded, as numerous examples of universities undertaking sustainable food initiatives are emerging across the world. For example, many universities now have sustainable food policies, such as the University of Cambridge in the UK (University of Cambridge, 2017) and Cornell University in the USA (Cornell University, n.d.), while others have developed leadership programs centred around sustainable food, for example, the SEED Wayne Program at Wayne State University in the USA (Ahee, 2013); and also, in the USA, the College and University Food Bank Alliance has been established by the Michigan State Student Food Bank and the Oregon State University Food Pantry to alleviate food insecurity and poverty amongst students (College and University Food Bank Alliance, 2015). In other parts of the world, initiatives are more broadly focussed on a range of sustainability issues, such as with the African Green Campus Initiative (South African Government News Agency, 2012) as well as in Asia, where networks of universities exist to support sustainability programs (Nomura and Abe, 2015).

The Australian university experience is different than that of students in the USA in that less than 5 per cent of university students live on campus (Australian Bureau of Statistics, 2013), compared to approximately 69 per cent of freshmen and 22 per cent of seniors in the USA (Kuh *et al.*, 2001). However, students in many other countries, especially across Europe, also tend to live off campus. For example, less than 10 per cent of students in Austria, Croatia, Switzerland, Serbia, Bosnia-Herzegovina, Armenia, Malta and Italy live in student accommodation (Hauschildt *et al.*, 2016). Therefore, there is less student reliance on dining halls. In Australia, food on campus is predominantly available through a large number of

food outlets, which are operated independently of one another. Thus, the food culture at Australian universities and others that do not use dining halls is not as easily altered as it may be in other countries, and unique challenges exist in developing a more local sustainable food economy.

Food culture has been variously defined depending on the emphasis of the specific discipline undertaking food research (Hedegaard, 2016). For this study, a wide-ranging definition of food culture is adopted which takes into account both the functional elements of the food system and the affective domain of food as identity and meaning making. Food culture then can be seen as encompassing the networks and institutions surrounding the production, distribution and consumption of food as well as the practices, attitudes and beliefs surrounding food (Long, 2017, 2015). Hedegaard (2016) reinforces the need for a multidimensional definition of food culture which includes political, nutritional, spatial and temporal elements. Within these dimensions, the social importance of food and eating should not be ignored (Gustafsson and Draper, 2009). This study was interested in examining food culture from four different perspectives, namely, the nutritional, social, economic and environmental. This definition, with its emphasis on interrelated and interdependent elements, provides a framework for understanding how students negotiate food procurement, consumption and disposal within a university campus context.

Most research into sustainable food at universities has come from the US (for example, Barlett, 2011; Campbell-Arvai, 2015; LaCharite, 2015; Pothukuchi and Molnar, 2015), with scant attention having been paid to university settings that rely on large numbers of independent food outlets to feed their staff and students. Given this, the aim of this study is to investigate the sustainability of the food culture on the main campus of an Australian university (the Burwood campus of Deakin University) and determine what the barriers and enablers to increasing the sustainability of the food culture on campuses reliant on independent food outlets may be.

Methods

An online survey was developed to investigate the opportunities and barriers for developing a food culture that contributes to creating a healthy and sustainable university setting. The survey was designed specifically to explore staff members' and students' on campus eating habits and their opinions about the range and availability of food and not to test a theoretical construct. However, the survey drew on the work of Vermeir and Verbeke (2006), who discussed perceived personal importance and product availability as being two factors which can contribute to sustainable purchasing decisions. The questions were designed to examine food culture from the perspective of its nutritional, social, economic and environmental aspects, and asked respondents to reflect on both the importance they placed on these characteristics and their perceived availability on campus. The survey consisted of questions relating to:

- students and staff eating habits on campus (social aspect of food culture);
- views on healthy and sustainable options on campus (nutritional, economic and environmental aspects of food culture);
- cost of food (social and economic aspects of food culture);
- food disposal on campus (environmental aspect of food culture);
- vision for the future; and
- participant demographics.

The survey was emailed to all staff and students in the university's faculty of health on the main campus in September 2015. Approximately 6,596 students and 951 staff were either studying or employed in the health faculty during the time of this study. The survey was available to staff and students for four weeks. To maximise the response rate, participants were offered the chance to enter in a draw to win one of 15 movie tickets. To be eligible for a prize, participants were required to provide their email address; however, it was made clear that this would be removed upon receipt of survey, assuring respondents of anonymity.

In addition to the staff and student survey, a short survey was developed for the food outlets on the campus and hand delivered to the ten food outlets on campus. The Burwood campus does not have any dining halls, and all food on campus is sold through ten independently operated food outlets. The outlets offer a range of cuisine options, including both Australian and international choices, pre-packaged meals, fast food, organic options and unprocessed foods. The survey asked for information about the types of foods sold, the barriers to providing specific types of foods (e.g. organic, seasonal) and their recycling and composting practices. The survey was anonymous, in which food outlets were not required to provide their outlet name on the completed survey. Each outlet was provided with one survey to be completed by the manager and a replied-paid envelope to return the survey.

Data from the surveys were entered into statistical software package SPSS version 23.0 for analysis. Descriptive statistics along with chi-squared analyses were used to interpret the data, which were considered statistically significant at $p \leq 0.05$. This research project received ethics approval from the Deakin University's Faculty of Heath Human Ethics Advisory Group (project number HEAG-H 59_2015).

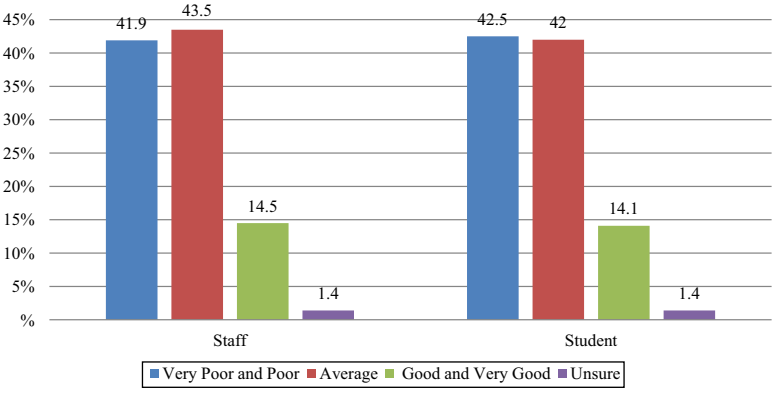
Results

Cleaning of data was performed before analysis – in this instance, the researchers decided that participant responses would be removed if it were clear that they had ticked the box to imply consent and exited the survey or if there were extensive data missing in the responses (Punch, 2003). This reduced the data set from 826 responses to 697, resulting in a response rate of 9.2 per cent. It is acknowledged that this is a low response rate; however, given the efforts taken to minimise non-response, infer that this may be a function of declining response rates in university surveys worldwide owing to "survey fatigue", resulting from an over-surveying of students (Nair *et al.*, 2008). Given that this survey was limited to those in the Faculty of Health, there is a potential bias towards individuals with a predisposition towards an interest in healthy lifestyles. This should be considered when interpreting the results. Future studies should seek to find ways to obtain data from a broader sample of the university community.

The respondents consisted of 126 (18 per cent) staff and 571 (82 per cent) students. Most respondents were female irrespective of staff (86 per cent) or student status (88 per cent), which is consistent with the notion that women are generally more interested in participating in research than men (Turner and Henryks, 2012). As to be expected, the student sample contained a higher number of younger respondents. Within the student sample, only 2.7 per cent of respondents live on campus and a slightly higher percentage (12.5 per cent) were international students. Most students (74.1 per cent) were undergraduates.

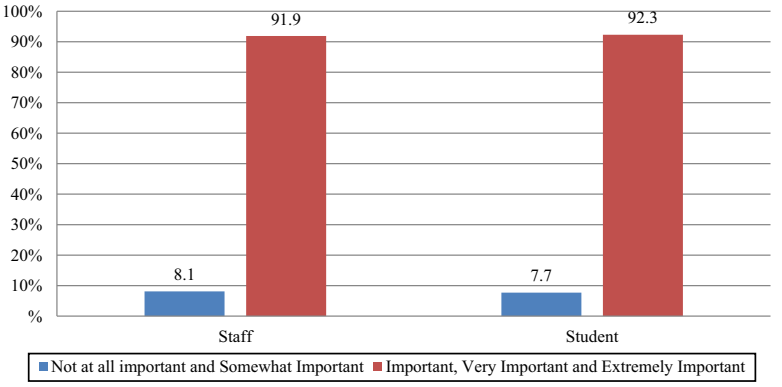
Figure 1 shows the percentage breakdown of how respondents view the availability of "value for money" food on campus, and Figure 2 displays the percentage breakdown of how important it is to respondents that there is "value for money" food on campus.

Chi-square tests for independence were undertaken and found no significant difference between staff and students' views on availability of "value for money" food



Notes: Staff $n = 124$; students $n = 553$

Figure 1.
Respondents' views (aggregate) on the availability of "value for money" food on campus



Notes: Staff $n = 123$; students $n = 542$

Figure 2.
Respondents' feelings (aggregate) of the importance of "value for money" food on campus

$[\chi^2\ (3, N = 677) = 1.87, p = 0.60]$ or views of the importance of "value for money" food $[\chi^2\ (1, N = 665) = 0.02, p = 0.89]$. When international students were compared to domestic students, the chi-squared test failed to show significance $[\chi^2\ (1, N = 539) = 0.09\ p = 0.76]$. In addition, no significant difference was found between students who live on campus compared to those who live off campus $[\chi^2\ (1, N = 535) = 1.2, p = 0.27]$.

Respondents were asked: In the past 12 months, were you ever hungry but didn't eat because there wasn't enough money for food? This question is taken from the US Adult Food Security Survey Module developed by the US Department of Agriculture (2012). The responses to this question are shown in Figure 3. Chi-square tests for independence were undertaken and found a significant difference between the responses of staff and students $[\chi^2\ (2, N = 683) = 48.86, p \leq 0.001]$. However, when international students were compared to domestic students, the chi-square test failed to show significance $[\chi^2\ (2, N = 552) = 4.20, p = 0.12]$. In addition, no significant difference was found between students who live on campus or off campus $[\chi^2\ (2, N = 549) = 2.28, p = 0.32]$.

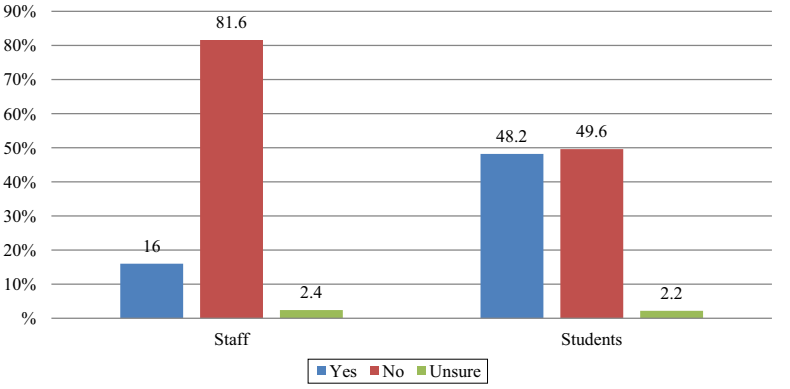
Respondents were asked to indicate how much they agreed or disagreed with the statement I do not buy healthy food on campus because it costs too much, and the results for it are displayed in Table I. Chi-square tests for independence were undertaken and a significant difference was found between domestic and international students' responses [χ^2 (2, N = 551) = 9.06, p = 0.01] and between staff and students' responses [χ^2 (2, N = 680) = 17.18, $p \leq 0.01$].

Figure 4 shows the percentage breakdown of how respondents view the availability of reheating facilities on campus, and Figure 5 displays the percentage breakdown of how important it is to respondents that there are reheating facilities on campus.

Figure 6 displays the percentage breakdown of how important a range of sustainable food issues are to respondents. No statistically significant differences were found between views of staff and students, international and domestic students and those who live on campus and those who do not, for any of these issues.

Respondents were provided with a list of possible sustainable food initiatives and asked to tick all that they would like to see on campus. The results for it are shown in Table II.

Students were asked to rate how important it is for them to belong to a university that abides by sustainability principles as expressed by its food culture, 80.5 per cent indicated that it was either important, very important or extremely important to them, whereas 18.6 per cent thought it was somewhat important or not at all important to them. When staff were asked to rate how important it is for them to belong to a university that abides by



Notes: Staff n = 126; students n = 557

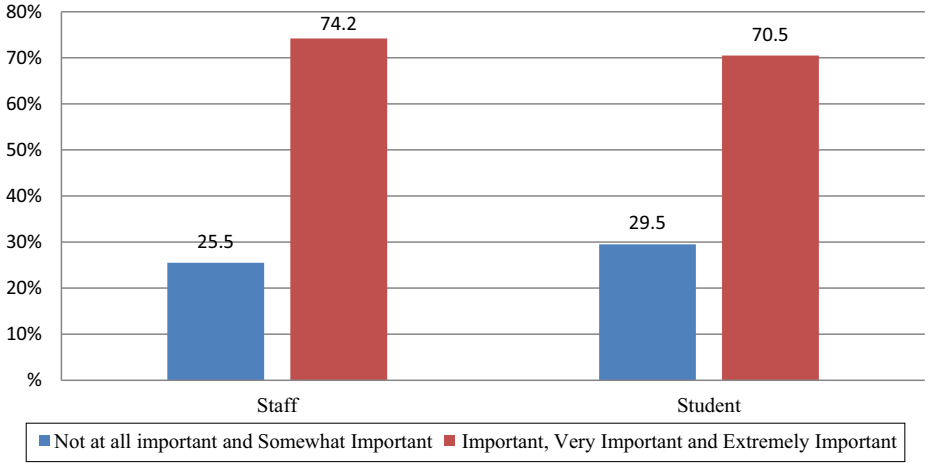
Figure 3. Respondents' answers to the question, "In the past 12 months, were you ever hungry but didn't eat because there wasn't enough money for food?

Table I. Respondents' opinions (aggregate) regarding healthy food and cost on campus

Survey statement		n	Agree and strongly agree (%)	Neither agree nor disagree (%)	Disagree and strongly disagree (%)
I do not buy healthy food on campus because it costs too much	Staff	123	39.0	38.2	22.8
	Domestic students	482	56.4	25.5	18.0
	International students	69	75.4	13.0	11.6

Notes: Staff $n = 124$; students $n = 553$

Figure 4.
Respondents' views (aggregate) on the availability of reheating facilities on campus



Notes: Staff $n = 123$; students $n = 542$

Figure 5.
Respondents' feelings (aggregate) of the importance of reheating facilities on campus

sustainability principles as expressed by its food culture, 85.9 per cent indicated it was either important, very important or extremely important to them, whereas 14.1 per cent thought it was somewhat important or not at all important to them. When staff and students were asked how much would an enhanced food culture, focusing on sustainability, contribute to various aspects of their university experience, the results displayed in Table III were found.

Six out of the 10 food outlets returned their questionnaires. Cost was identified as the main barrier to stocking foods with more sustainable credentials (e.g. locally produced, free range, fair trade, organic) by four respondents.

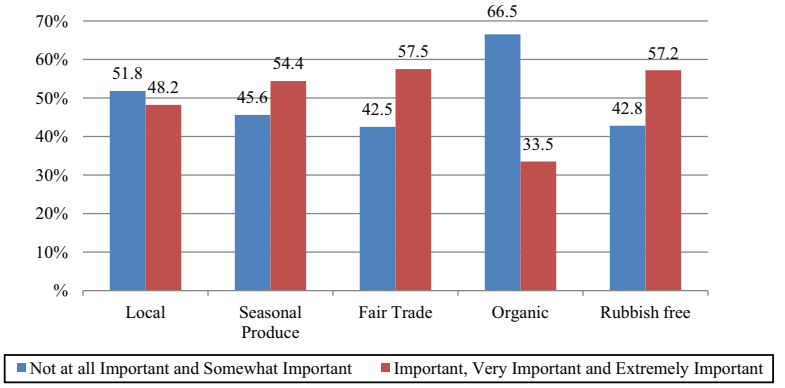


Figure 6.
Respondents' feelings (aggregate) of the importance of a range of sustainable food options on campus

Note: n = 664-668

Table II.
Respondents' support for possible sustainable food initiatives on campus

Sustainable food initiative	n	(%)
Farmer's markets	453	65.0
Student access to kitchenettes	420	60.3
Community garden	383	55.0
Increased recycling facilities	327	47.0
Compost facilities	307	44.0
Food co-op	303	43.5

Table III.
Percentage breakdown of staff and students' opinions (aggregate) on how an enhanced food culture focusing on sustainability would contribute to various aspects of their university experience

	Staff			Students		
Survey statement	n	Not at all important and somewhat important (%)	Important, very important and extremely important (%)	n	Not at all important and somewhat important (%)	Important, very important and extremely important (%)
Sense of pride in your university	118	27.1	72.9	555	24.1	75.9
Sense of belonging to your university	119	40.3	59.7	555	32.6	67.4
Developing attitudes and values on sustainability	120	33.3	66.7	553	20.3	79.7
Likelihood of spending more time on campus	118	51.7	48.3	553	33.8	66.2

Discussion

Whilst the majority of staff and students feel that having value for money food on campus is either important, very important or extremely important to them, in contrast almost half believe that value for money food is not adequately provided on campus. This finding highlights that the cost of food on campus is of great importance to staff and students, yet the options on campus are not currently aligned with staff and students expectations of what constitutes value for money food.

It was found that international students do not appear to be more concerned about the price of food on campus than domestic students, and the cost of food is not more important to students living on campus than off campus. These findings are somewhat surprising, as one may expect that international students are facing more financial pressures than domestic students (Khawaja and Dempsey, 2008). Perhaps the low numbers of international students completing the survey has not enabled a statistically significant relationship to be uncovered. Future research more specifically targeted at investigating how international students view the cost of food on campus would be of great benefit to the development of a more sustainable food culture. It could also be assumed that students living on campus would be more concerned about the cost of food on campus. As it is their place of residence, they would possibly be more invested in having a large range of value for money options available. The fact that this study did not find this to be the case is interesting; however, given the low numbers of resident students completing the survey, more research looking at how students living on campus view the cost of food at university would be well-placed. In addition to this, given the skew towards female participants, it should be noted that the data may have been influenced by this. While some researchers (Pedrini and Ferri, 2014) have not found gender to be significant in terms of views on sustainable purchasing, others (Elliott, 2013) have noted that women tend to have more positive views on sustainable food consumption. This potential bias should be taken into account when considering the results and implications.

Although food security was not intended to be a main focus of the study, one question from the US Adult Food Security Survey Module (US Department of Agriculture, 2012) was included in the survey as a means for the researchers to gauge if this was an area that would warrant further research. The finding that almost half of all student respondents indicated that in the past 12 months, they had felt hungry but had not had enough money for food, indicates that this needs further investigation on this campus. This finding is in line with previous research which consistently shows that university students both in Australia and overseas have a high degree of food insecurity (Chaparro *et al.*, 2009: Bexley *et al.*, 2013; Hughes *et al.*, 2011; Micevski *et al.*, 2014). If students are hungry at university this is likely to negatively impact upon their experience of university, as studies have found food insecurity to be associated with anxiety, fatigue, lethargy and illness (Burns *et al.*, 2010; Hamelin *et al.*, 2002; Ramsey *et al.*, 2012; Seligman *et al.*, 2010; Vozoris and Tasasuk, 2003). Whilst no studies have investigated the impact of food security on academic performance at the university level (Micevski *et al.*, 2014), other research on food security has demonstrated that being food insecure can negatively affect the academic performance of children and adolescents as a result of reduced attendance, aptitude, motivation and concentration (Jyoti *et al.*, 2005; Ni Mhurchu *et al.*, 2010). In addition, Micevski *et al.* (2014) theorise that with a greater reliance on employment that may accompany food insecurity, time allocated towards study can be sacrificed. Further research is required to ascertain the prevalence of food insecurity on campus and any impacts that this may be having on students.

A number of quotes from the online survey illustrate that the cost of food on the Burwood campus is resulting in students forgoing eating on campus, as the cost of food is prohibitive:

> I stay hungry sometimes because I don't want to pay $5 for a small tub of sweet yogurt or $12 for a meal that elsewhere, like say shopping centre food court, will cost $5-8. Just feel like students are being seriously ripped off on campus. – Student, female, aged 31-40.

> The food on campus is ridiculously expensive. I've stopped buying coffees and food because I can't afford it. – Student, female, aged 21-30.

It is important to note the high proportion of staff, domestic students and particularly international students that either agreed or strongly agreed with the statement I do not buy healthy food on campus because it costs too much. It is acknowledged that respondents may have slightly different personal definitions of "healthy"; however, given the wide use of this term in society, the authors do not feel that this would have adversely affected the results. Students were statistically more likely than staff to agree that they do not buy healthy food on campus because it costs too much. However, the percentage of staff indicating they do not buy healthy food on campus because of the cost is still high in its own right. It is interesting to note that although no significant difference was found between domestic and international students' concern about the price of food on campus, here it can be seen that international students were more likely to indicate that they do not buy healthy food on campus because it costs too much. Given that international students face more financial pressures than domestic students (Khawaja and Dempsey, 2008), it stands to reason that they would be more concerned with how they spend their money, and they would prioritise cheap food over nutritional value. Future research more specifically targeted at investigating how international students view the cost of healthy food at university would be beneficial to the development of a more sustainable food culture.

The open-ended portion of the online survey further demonstrates that although the majority of respondents are in favour of having healthy options in food outlets, cost is a significant barrier to them purchasing such foods:

> Personally, I find the price of healthy food at university to be the biggest barrier in healthy eating. There have been many times when I have wanted a fruit salad or a healthy roll from a cafe on campus, but have opted for cheaper, less healthy foods because I cannot afford healthy food. – Student, female, aged 21-30.

> My main issue with the food on campus is the pricing. I can rarely justify spending almost $15 on a healthy sandwich or salad and a coffee/tea, so I either go for some less pricey junk food. – Student, female, aged 21-30.

Between 40 and 60 per cent of staff and students rate the importance of seasonal produce, locally grown/produced food, fair trade and rubbish free foods (i.e. no waste by-product or biodegradable packaging) as either important, very important or extremely important. This shows that these sustainability features are not as important to staff and students as the availability of low cost foods. One plausible explanation is that the high cost of food is such a high-ranking concern amongst staff and students that other issues become less important, and cost is the main consideration for respondents purchasing foods on campus. Another possible explanation is that it is a function of the sample including staff and students from the Faculty of Health. Perhaps respondents' interest in food is skewed towards its health attributes, with them having less interest in sustainability. Future studies should seek to include a broader sample of staff and students so this potential bias can be ruled out. Although these features were found to be not as important to staff and students as the availability of low cost foods, the result suggests that these sustainability considerations are moderately important to respondents.

Of interest is the finding surrounding organic foods and the importance respondents place on them. In comparison to the food sustainability features mentioned above, only approximately 25-35 per cent of respondents rated the importance of organic food as either important, very important or extremely important. This is perhaps a result of the high cost that is well-documented to be associated with organic foods (Australian Organic Food Directory, 2016) and once again highlights the finding that cost is the main feature driving decisions regarding food purchases on campus. Previous studies have yielded mixed results in regards to university students' views on organic food; for example, Pelletier *et al.* (2013) found that respondents placed similar levels of importance on their food being organic as they did other factors, such as produce being locally grown, whereas Campbell-Arvai (2015) noted that many students were unsure whether organic foods could help the environment. Inconsistent information about the yields of organic crops may be causing confusion. While some scientists have highlighted that organic farming produces lower crop yields and therefore requires significantly more land to be farmed to produce the same amount of food (Savage, 2011), others have demonstrated that it could potentially produce enough food for the world's population without an increase in land use (Badgley *et al.*, 2007). Additionally, there have been numerous cases of organic products being mislabelled (Müller and Gaus, 2015) which could have potentially caused respondents to develop a mistrust of organic labelling; however, such cases are not unique to Australia. Considering these points, perhaps respondents have a level of uncertainty about the validity of organic labelling and/or the environmental benefits of organic products and therefore do not consider it to be an important consideration in their food purchasing habits. Given the small numbers of participants indicating organic food is important to them compared to other sustainability features, further research into how university students view organic food, as well as greater investigation of sustainability claims of the organic food industry would be good avenues for future research.

Results from the food outlets survey suggest that cost is the main barrier to stocking foods with more sustainable credentials (e.g. locally produced, free range, fair trade, organic) and the following quote illustrates that food outlets do not feel that students would not be willing to pay more for such options, for example:

> I can't absorb the costs here and then they would have to be passed on to the students who won't pay – Food outlet survey respondent.

This further highlights that cost is the number one barrier to the adoption of a sustainable food culture. This research shows that students are already unhappy with the high price of food on campus, and therefore, they are unlikely to be willing to pay extra for more sustainably produced food. The food outlets are aware of this, and therefore appear unlikely to increase the supply of such foods.

It is evident from the results that both staff and students feel that it is important to them to belong to a university that abides by sustainability principles as expressed by its food culture. Both staff and students generally believe that an enhanced food culture, focusing on sustainability, would contribute greatly to their sense of pride in and belonging to the university. Considering the importance placed on "experience" and "developing a relationship" with the university as outlined in its live agenda (Deakin University, 2015, p. 15), there is a viable platform of support for such an enhanced food experience. However, given that cost is likely a major barrier to the campus developing a more sustainable food culture through its food outlets – there is a need to look to other ways to bring about a healthier and sustainable university setting. One way of doing this is to develop sustainable food initiatives that do not rely on payment by staff and students. This survey found there

to be considerable support for such sustainable food initiatives, with popular ideas being student access to kitchenettes and the development of a community garden. Previous research into the feasibility of the development of a community garden on campus showed overwhelming support for such a project (Nuttman *et al.*, 2015). Based on the research by Nuttman *et al.* (2015), a community garden steering committee was established and was successful in establishing a community garden on campus in April 2016. So far, more than 60 volunteers have signed up to work in the garden, and these volunteers are able to take home what they grow and harvest, with the remainder of produce used in the student life cooking program for students (Chowdhury, 2016). This initiative has the potential to help alleviate the cost barrier that currently exists in regards to staff and students accessing healthy, sustainable food on campus.

However, the initiative also has the potential to improve the social aspect of food culture through increasing student engagement. A lack of student engagement with the university experience is an issue that is of concern across a number of countries (McInnis, 2013). In Australia, research has shown that indicators of engagement with the university community have fallen since 2009 (Baik *et al.*, 2015). For example, 32 per cent of first year students reported keeping to themselves in 2009, compared to 44 per cent in 2014. By extension, only 65 per cent of students had made at least one or two close friends at university in 2014, compared to 74 per cent in 2009 (Baik *et al.*, 2015). Additionally, in 2014 less than half first year students felt a sense of belonging to the university community (Baik *et al.*, 2015). Given that making friends is positively associated with students' satisfaction with their university experience (Baik *et al.*, 2015), these trends are worrying and universities need to be working to improve the social cohesion among their cohorts. Community gardens have been shown to create opportunities for a range of culturally diverse groups of people from all ages to develop a sense of community (Crouch, 2003; Rhode and Kendle, 1997; Shinew *et al.*, 2004), thereby highlighting the added potential of fostering a sense of community and belonging among the university cohort.

In regards to the most popular sustainable food initiative selected by participants, a monthly farmers market (selling fresh produce, freshly baked breads and cakes, as well as other things such as nuts and spices) began operating from the campus in February 2016 (Deakin University, 2016), further increasing the sustainable food initiatives on campus. These initiatives have the ability to realise the potential that Orme and Dooris (2010, p. 432) alluded to when they wrote "[...] it is important to recognise the potential that higher education has to involve and support its massive student population in more local sustainable food economies". So therefore, despite cost being a barrier, by being proactive and implementing sustainable food initiatives, it is possible to take steps towards the development of a healthier and more sustainable university setting, whilst simultaneously improving the sense of community and belonging among the university cohort. As they are in their infancy, future research into how the development of the community garden and presence of the farmers market affects the food culture on campus will be undertaken to quantify the benefits both to the university community and the environment.

The second most selected sustainable food initiative was student access to kitchenettes, which also emerged from the research as a very important issue to staff and students, with many students lamenting the lack of access to reheating facilities. The ability to reheat food from home presents staff and students with an alternative to purchasing food on campus and, thus, can alleviate some financial pressure from staff and students. The results show that staff are more likely to rate the campus' reheating facilities higher than students. This is to be expected, as staff have access to kitchenettes and do not have to rely on food outlets. In contrast, there are only two areas on campus that have microwave facilities for students. This

paucity of reheating facilities is reflected in the lower rankings students attributed to the availability of such facilities on campus, with approximately 40 per cent rating their availability as either poor or very poor. The results show that having access to reheating facilities is a very important issue to both staff and students, and this can be illustrated through the following quotes from the survey:

> More microwaves!!!! – Student, female, aged 21-30.

> The facilities [sic] for students to bring their own meals is very poor. Food brings different cultures and groups of people together. I know at other unis there is a "common room" kind of area for students from each faculty which have kitchen facilities, microwaves, toasters, kettles and toastie ovens. Although this survey asks about food, I think this would improve the connectivity of the cohort. – Student, female, aged 21-30.

The above quote also demonstrates that if done in a strategic fashion, the implementation of more kitchenettes could have the potential to foster a sense of community and belonging among the university cohort.

Conclusion

This research study was concerned with investigating how food culture contributes to a healthy and sustainable university setting. The results have shown that currently, the most pressing issue impacting on the food culture on the Deakin Burwood campus is the high cost of purchasing food on campus. It is an issue that is of major concern to staff and students alike, and it is resulting in a number of students choosing to go hungry rather than eating whilst at university. Another aim of this research was to uncover the barriers and enablers for fostering a healthy and sustainable setting at Deakin through its food culture. It is concerning that high proportions of staff and students do not buy healthy food on campus because it costs too much. Of particular concern is the very high number of international students who currently do not buy healthy food on campus because it is too expensive. The results show us that cost is the main barrier to Deakin fostering a healthy food culture on the Burwood campus. However, it should be noted as this finding is based on a small number of international students, future research aimed at investigating how international students view the cost of healthy food at university would be beneficial. The results have shown that whilst the majority of staff and students view the issues of food sustainability (seasonal produce, locally grown/produced food, fair trade foods and rubbish free foods) as important, such considerations are not viewed as important as the cost of food on campus. This shows that, as with healthy eating, cost is once again a barrier; in this case, it is a barrier to Deakin fostering a sustainable food culture on the Burwood campus. However, as the sample comprised staff and students from the Faculty of Health, it may be that respondents' interest in food is skewed towards its health attributes, with them having less interest in sustainability. Future research should attempt to reach a wider sample so that this potential bias can be ruled out.

An enabler to a healthier and more sustainable food culture, which also improves the social connectivity of the cohort, may be the implementation of sustainable food initiatives that do not require a cost outlay from staff and students. This research provides encouragement to universities that rely on multiple independent food outlets, where there is no direct control over the food choices provided, that it may be possible to bring about a more sustainable food culture through the implementation sustainable food initiatives, such as community gardens, farmers markets and improved student access to kitchenettes.

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