Shop Smart, Shop Local

Comparing the Cost and Origin of Food at Farmers Markets, Supermarkets and Independent Greengrocers in the Lismore Local Government Area

A research project conducted by Griffith University dietetics and nutrition students, Jasmin Moore & Sarah Why under the supervision of the Northern NSW Local Health District Health Promotion Unit and Red Cross Northern Rivers Food Security Officer.

COMPARING THE COST

A seasonal basket of 20 items [1kg of each product) was \$187 at supermarkets and \$213 at farmers' markets in the Lismore local government area. Smart shoppers could pay the same at farmers' markets for a full basket if they avoided the more expensive meat and dairy items.

IS AFFORDABLE and local

Shopping at

LOCAL

Nearly 70% of farmers' markets produce was sourced within 50 km of the Lismore central business district, compared with supermarkets at 12%.

30

AFFORDABLE



Vegetables and nuts were significantly cheaper at farmers' markets when compared to supermarkets.

 Fruit, bread, eggs, tofu and honey were similarly priced. E C

Meat and dairy were more expensive.



ORGANIC

A selection of organic fruit and vegetables was cheaper at farmers' markets (\$50) when compared to supermarkets (\$58).



NINE OUT OF TEN PEOPLE DON'T EAT THEIR DAILY RECOMMENDED SERVE OF VEGETABLES. FARMERS' MARKETS OFFER AN AFFORDABLE SOURCE OF SEASONAL, LOCALLY GROWN VEGETABLES.

Based on research undertaken by Grifflih University Dietelics & Nutrition students Josmin Moore and Sarah Why in conjunction with Red Cross and Northern NSW Local Health District Health Promotion. Produced by the Northern NSW Local Health District Health Promotion Unit. Full research report available at https://nnswihd.health.nsw.gov.au/health.pramotion/healthyplaces.and spaces/healthylocals/add/div/ava.haw/



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Introduction and Aim:

The community of the Northern Rivers region prides itself on production of a large variety of fresh produce and values the local food supply. However, there has been no objective evidence to inform community members on which retail environments (i.e. farmers' markets (FM), supermarkets (SM), or greengrocers (GG)) sell the cheapest and most locally sourced produce. Thus, the aim of this project was to compare FM food prices and origin with that of SM and GG in the Lismore local government area (LGA). This project was undertaken by Griffith University dietetics and nutrition students, in partnership with the Northern NSW Local Health District and Red Cross.

Method:

A representative seasonal basket comprising of 20 food items was selected to compare price per kilogram and origin data from 6 FM, 5 SM and 3 GG in the Lismore LGA from early March-April 2018. The seasonal food basket was modelled from previous research based on the Victorian Food Basket, as well as popular food consumed by Australians identified in the National Health Survey (2016) and in accordance to the Australian Guide to Healthy Eating (National Health and Medical Research Centre, 2013). Data was collated in spreadsheets and analysed quantitatively, for comparisons and variations between each of the retail environments.

Results:

The representative seasonal basket was cheapest at SM (\$187) followed by FM (\$212.50) and GG (\$252). Nuts and vegetables were significantly cheaper (by \$9) at FM compared with SM, while tofu and honey were marginally cheaper (50c and \$2 respectively). Meat, eggs and dairy products were more expensive at FM than SM (\$15, \$1.50 and \$27.50 respectively), with chicken breast and cheese contributing to most of the meat and dairy products' price differences (\$8 and \$21 respectively). A basket of organic fruit and vegetables was cheaper in FMs than SMs (\$50 and \$58 respectively). Almost 70% of the produce at FM was sourced within less than 50 km distance of Lismore CBD, and nearly 97% of the produce from SM and GG is obtained from places not specified within Australia.

Conclusion:

These findings challenge the perception that cost of produce at FM is significantly more expensive than SM and highlights the large prevalence of local produce available at FM compared to both SM and GG. Shoppers who prioritise sustainable food systems and support local food supply should purchase the seasonal basket at FM. For those who are limited financially, yet still value local food and sustainability, purchasing most items from the seasonal basket (fruit, vegetables, bread, tofu, nuts and honey) will be the same price, or more affordable at FM whilst meat, eggs and dairy produce may be more affordable at SM. However, selective shopping of meat and dairy products at FM will minimise this price difference considerably. Future research could investigate the differences in price and origin between retail environments in other LGAs in NNSW.

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Introduction

Eating a balanced diet consisting of fruits, vegetables, lean meats/alternatives, dairy/alternatives and grains, minimises diet related chronic disease risk such as coronary heart disease, stroke, hypertension and type 2 diabetes (Australian Institute of Health and Welfare, 2018). Alarmingly however, 90% of Australians aren't consuming the recommended intake of vegetables, 85% aren't eating enough lean meats, poultry, fish, eggs, legumes, nuts and seeds and 50% aren't consuming the recommended intake of fruit (Australian Bureau of Statistics, 2016). Rather, one third of the population's total daily energy intake is comprised of discretionary food and beverages (ABS, 2016). Such foods and beverages are high in saturated fat, sugar and salt which are detrimental to our health and exacerbate chronic diseases (AIHW, 2018).

Food insecurity is one of the main reasons why vulnerable populations in Australia may not be meeting the recommended nutritional servings outlined by the Australian Guide to Healthy Eating (Rosier, 2011). Food security is defined as access by all people at all times to enough food for an active, healthy life, and at a minimum includes; ready availability of nutritionally adequate and safe foods, and the assured ability to acquire personally acceptable foods in a socially acceptable way (Campbell, C. C., 1991). As such, food insecurity exists when food security is limited or uncertain (Campbell, C. C., 1991). Thus, limited food security begets limited food choice, often resembling cheap discretionary foods and beverages. Other barriers that can act as determinants for food choice include financial instability, unsafe physical environment, inaccessibility or unavailability of fresh produce, lack of cooking/culinary skills, poor nutrition literacy and level of convenience **(**MacLellan, Gottschall-Pass & Larsen, 2004).

There are numerous factors which influence consumers' food purchasing decisions. However, in many rural and remote areas, fresh food choices are very expensive or limited if there are few or no local food sources. Provenance/origin can also act as a motivating factor for food choice for consumers who value and support locally sourced produce and growers. This motivating factor of purchasing locally grown, fresh food is a characteristic particularly upheld by FM shoppers since FM produce is predominantly locally sourced and the provenance of the produce is known (Wolf, Spittler and Ahern, 2005). Additionally, studies have recorded personal motivators for buying local such as; more pleasurable (better taste, connectedness with rural life), seen as healthier, and perceived as safer than non-local food (Constanza Bianchi, Gary Mortimer, 2015). However, according to Khan and Prior (2010), there is also a perception that locally sourced food is associated with more costs and limited continual availability as well as accessibility. These perceptions act as a barrier for people consuming local food (Khan and Prior, 2010). As such, James (2015), agrees that an understanding of an environmentally sustainable food supply, seasonal availability and access to local food emerge as the biggest challenges to consumers in buying local food.

The study of consumers' shopping habits for SM, FM and GG is still in its infancy as there is little evidence to indicate where people shop for their groceries. However, what is known is that the Australia's SM and GG industry is fiercely competitive and highly concentrated, with the four largest operators accounting for almost 80% of total industry revenue (Mudditt, 2017). Coles and Woolworths alone account for 60% (Mudditt, 2017). Aldi currently holds an estimated 8.9% of Australia's market (Mudditt, 2017). From the perspective of many local food advocates, alternative systems of distribution are seen as a tangible solution to the SM monopoly over the mainstream food system (Harris 2009). As such, outlets such as FM provide farmers with an alternative form of

distribution, selling directly to consumers. According to Hope & Henryks (2015), Australian FM have been growing strongly since 1999, currently representing 7% of the fresh food market (compared with SM 50%). This growing market is a result of increasing consumer demand for local food, particularly in developed countries due to growing awareness of environmental and health related issues and sustainable economies (Arsil *et al.*, 2013 & Constanza Bianchi, Gary Mortimer, 2015)

The Northern Rivers region produces a great variety of food products, including fruits, vegetables, meat, dairy products, nuts, gourmet food, sugar, as well as coffee and tea and numerous animal crops (Regional Development Australia- Northern Rivers, 2011). Driven by this land's profitable food industry as well as increased consumer demand for local, fresh produce, there appears to be remarkable support for this region's food supply industry. This is evident by the values upheld by active community organisations such as Sustain Food, Red Cross and Northern Rivers Food that aim to provide continual support and advocacy for the Northern Rivers region food supply.

There is a large variety of FM that run weekly through the region with six of them held within the Lismore LGA. These markets include Lismore Organic Markets (Tuesday, 7:30-11am), Lismore Produce Markets (Thursday, 2:30-6:30pm), Lismore Farmers Markets (Saturday, 7-11am), Lismore Car-boot Markets (Every 2nd Sunday- 7:30-2pm), Nimbin Farmers Markets (Wednesday, 3-6pm), Blue Knob Farmers Market (Saturday, 8:30-12pm). This plethora of FM within the Lismore LGA acts as competition for other retail environments such as GG and SM in regards to providing local, fresh produce that supports sustainable environments and economies.

This research report aims to inform the shopping choices of Lismore LGA residents and visitors by comparing the origin and cost of selected produce in a seasonal basket between three major retail environments, SM, GG and FM, within the Lismore LGA. This research was undertaken in partnership with the Northern NSW Local Health District and Red Cross. As such, the findings of the report will be used by these organisations to inform interested community members, including financially vulnerable people, where the cheapest and most locally sourced produce can be purchased from.

Retail Environments

Farmers' Markets

All six FM within Lismore LGA were included in this study. The FM were; Lismore Organic FM, Lismore Thursday FM, Lismore Saturday produce market, Lismore Sunday Car Boot market, Nimbin Wednesday FM and Blue Knob Saturday FM.

Supermarkets

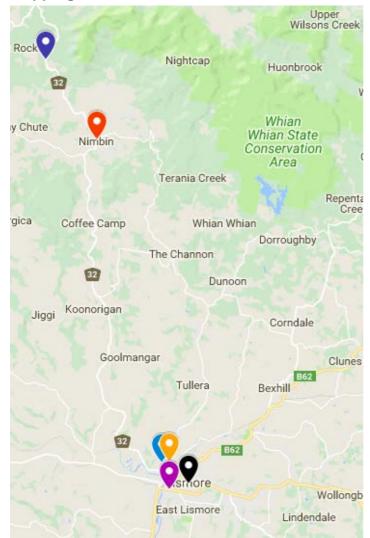
The following five SM were selected for this research; Coles, Woolworths, Aldi, Foodworks and SPAR. These retail environments were selected as they were the major food distributors within and around Lismore CBD and for ease of data collection. It was assumed that people who live in surrounding villages and towns buy fresh produce when they are in Lismore. Determining shopping and buying habits of Lismore LGA residents was beyond the scope of this study.

Green Grocers

The following three GG were selected for this research; Farmer Charlie's, Pirlo's Drive-in Fruit Barn and Lombardo's Fruit Market. Based on their geographical locations within Lismore LGA and local site (one near the CBD and two in suburbs which are not an easy walking distance from the CBD), these were the 3 main GG with a retail environment that best suited the GG definition. Although there are a preponderance of smaller GG throughout the LGA (eg. fruit shops and corner stores), these were not included in the study because of their limited range of goods (often no meat, tofu, dairy).

Which sites, how many and why.

The sample group of the above retail environments consisted of 6 FM, 5 SM and 3 GG. The sample size was influenced by the timeframe required for data collection in order to complete the project on time. Knowledge and insight of the local area was provided by key stakeholders and with the assistance of the market guide (appendix 1) which was used to create a calendar of market visits.



Mapping of Farmers Market in the Lismore LGA

The coloured markers indicate where each of the six FM are located in the Lismore LGA

Lismore CBD
 Lismore Thursday Farmers Market
 Lismore Organic Farmers Market
 Lismore Farmers Market
 Nimbin Farmers Market
 Blue Knob Farmers Market

Data Collection

Selection criteria

The methods to select the items for the seasonal basket were based on the Victorian food basket which focused on commonly eaten foods and used the Nutrient Reference Values as the

benchmark for nutritional adequacy of the basket (Palermo, C., & Wilson, A. 2007). However, unlike the Victorian food basket, this study was not designed to focus on sustaining a family for a week. Rather, for the purpose of comparison and scope of this project, this report explores a sample basket of seasonal produce that compares the cost per kilogram and food origin. Understanding common foods Australians consume (ABS, 2016) was at the forefront of the decisions as research findings would be easily relatable to the community. The selection of food was also based on the five food groups recommended by Australian Dietary Guidelines (NHMRC, 2013).

Fruits and vegetables were selected based on colour variety, with vegetables including one starch, one leafy green and three additional vegetables which created colour diversity. Meat and alternatives were selected to include a variety of animal proteins such as chicken breast, beef rump and fish, plus vegetarian options like eggs and tofu. All three dairy options were chosen for inclusion; milk, cheese and yoghurt. One type of grain was chosen; bread. Nuts were separated from the meat and alternatives food group because of nuts' comparatively higher price, which would have skewed the results. In addition, honey was by itself as a food category and included in this study as it was found to be a FM staple. The final basket included 20 items, (fruit: banana, grapes, apples, vegetables: potatoes, capsicum, tomatoes, Carrots, mixed lettuce, meat, eggs, tofu: Chicken breast, Steak - rump, Fish, Eggs, tofu, dairy: milk, cheese, yogurt, nuts: macadamias, pecans, multigrain bread and honey). For comparison of organic and non-organic produce, baskets included the 3 fruit and 5 vegetables as detailed above. Organic fruit and vegetables were the only produce included in the organic basket as they were consistently available across both FM and SM.

Before commencing data collection, an Excel spread sheet was created. This included selections for each of the seven food categories with food items listed within each category. For each of the sites visited within each retail environment, cost and provenance were entered. There were also sections to record qualitative data that described the environment e.g. undercover, parking, travel/transport.

Locally available seasonal foods which fitted the criteria described above were selected based on availability in FM, as they sell mainly local foods. The prices of these items were then checked in other retail environments. This allowed room for trends to be discerned so that if an item only showed up in one of the six FM it would be excluded from the seasonal basket, compared to an item that is available at all FM. Sale items were also excluded for fair comparisons of the three retail environments. After items were collected broadly and trends were noted, fruit and

vegetables were chosen for the baskets specifically based on seasonality, hence the name 'seasonal basket'. We also referred to the Byron Bay Seasonal calendar as it is quite close to Lismore LGA (Byron Bay Farmers Market, 2018) (appendix 2).

Data collection timing, recording and entry method

Data collection commenced 6th March and was completed 17th April. Data was initially collected using a paper template which included a table and space to allow for the recording of items, price per kilogram and provenance however, this method was updated to allow easy and quick data entry using the excel phone app. The raw excel spreadsheet included broad data of common food items from the FM which was accessible to both team members and resulted in efficient data entry.

Each SM/FM/GG took on average one hour to collect data, excluding travel time. Time was tracked using the 'time-tracker' phone app and totalled 40 hours for data collection. Data collection consisted of 8hr days twice a week, Monday and Tuesdays and out of work hours to allow for FM, which generally were outside of work hours and weekends.

Provenance/Origin and other contextual data collection

Origin and growing location of the seasonal basket items were obtained by interacting with the sellers at the FM, talking with GG shop owners and SM employees, and using food labels (where specified). The accuracy of the origin data was not verified and was taken at face value. The collation of origin data was split into the following categories: 'Within 50km road distance from Lismore CBD', 'Within 50-210km road distance from Lismore CBD', 'Within the rest of Australia' and 'International'. Distance was calculated by the distance (km) via road map. A distance of 50-210km was determined based on the distance from Lismore CBD and Brisbane by road. In addition to the quantitative data, further information was collected about the accessibility, parking availability, number of stalls, aesthetics, built environment, such as whether the market was undercover/open air or under a permanent structure, and availability of EFTPOS and ATMs. FM managers were asked for a copy of their market policy to gain further understanding of each market's definition of 'local' in relation to stall holder entry eligibility. Due to a low response rate from FM managers, this data was not comparable and thus not added to the report.

Data collection at the retail environments

The seasonality and availability of items at FM determined what was going to be collected at the SM and GG, which allowed like-for-like comparison. For all three retail environments data was recorded in the Excel spread sheet. When prices and weight were not visible, sellers were approached to obtain the required information. All weights were converted to kilograms. If weight was not measurable e.g. no scales or visible sign indicating weight, the average weight of that specific item would be recorded according to Food Standards Australia New Zealand (2011). FM were visited out of work hours, whilst SM and GG were visited within work hours. During each visit, one person would collect data for fruit and vegetables while the other collected dairy, meat, eggs, tofu, bread, nuts and honey. The cheapest and most expensive price points were also recorded to show the cost variance within SM, FM and GG.

Findings

Overall cost of conventional fresh produce

The seasonal basket of produce cost \$187, \$212.50 and \$252 in SM, FM and GG respectively.

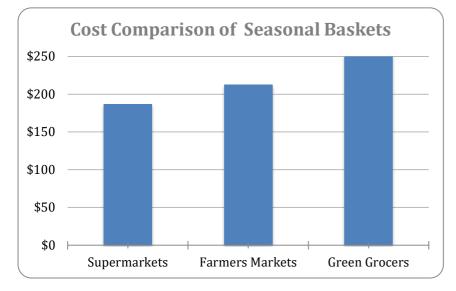
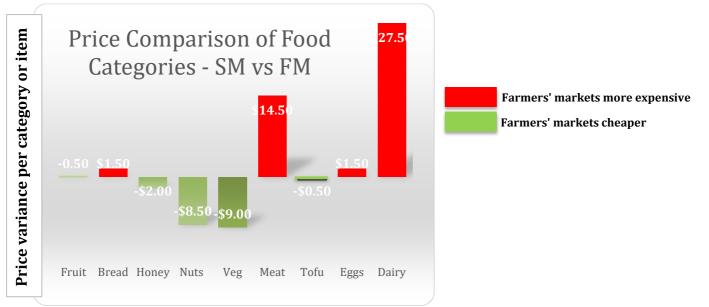


Chart 1: Seasonal Baskets

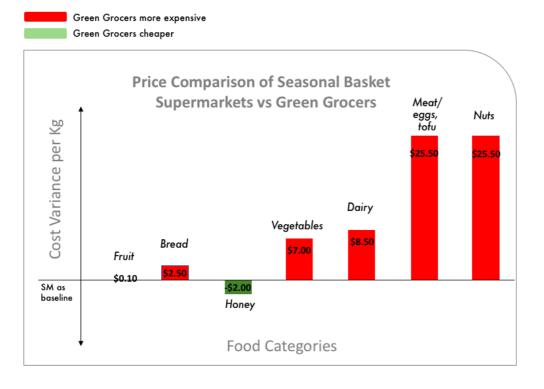
The overall prices of the seasonal basket (20 items - 1kg of each item) was compared. The SM seasonal basket was the cheapest and the GG basket most expensive. The FM seasonal basket is \$26 more expensive than SM basket.





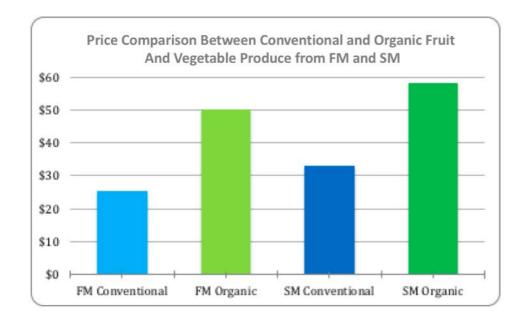
Price comparison of SM vs FM with produce separated into nine food categories and items (fruit, bread, honey, vegetables, meat, eggs, tofu, dairy and nuts). The red bars above the line indicate the FM produce is more expensive than SM produce, whilst the green bars below the line indicate that FM produce is cheaper. The following figures represent the total cost variance of FM produce compared to SM; Fruit = +\$0.50, Bread = +\$1.50, Nuts= -\$8.50, Veg= -\$9, Meat = +\$14.50, eggs = \$1.50, tofu= -\$0.50 +\$16, Dairy = +\$27.50 Honey = -\$2. Compared to SM, nuts and vegetables were cheaper in FMs, meat and dairy were more expensive, and fruit, bread, eggs, tofu and honey were similarly priced.





Price comparison of SM vs GG with produce separated into seven food categories (fruit, bread, honey, vegetables, meat/eggs/tofu, dairy and nuts). The red bars above the line indicate that GG produce is more expensive than SM produce, whilst the green bars below the line indicate that GG produce is cheaper. The following figures represent the total cost variance of GG produce compared to SM: Fruit = +0.10, Bread = +2.50, Honey = -2, Veg = +7, Dairy = +8.50, Meat/alternatives = +25.50, Nuts = +25.50.

Chart 4: Price Comparison of Organic Fruit and Vegetables Vs Conventional at Farmers' markets and Supermarkets



Price comparison between conventional (non-organic) and organic fruit and vegetables per basket, from all SM and FM. The basket consisted of 6 items; 3 fruit and 3 vegetables. FM conventional basket = \$25.50, FM organic basket = \$50, showing FM organic basket is twice as expensive than FM conventional basket. SM conventional basket = \$33, SM organic basket = \$58, showing SM organic is 1.75 times more expensive than SM conventional basket. Purchasing conventional or organic fruit and vegetables at FM is cheaper than at SM, but in both FM or SM, organic produce is much more expensive than conventional fruit and vegetables.

Provenance/Origin of food items

FM had a significantly higher proportion of locally produced food. Nearly 70% of FM produce was sourced within 50 km of Lismore CBD. See following graphs.

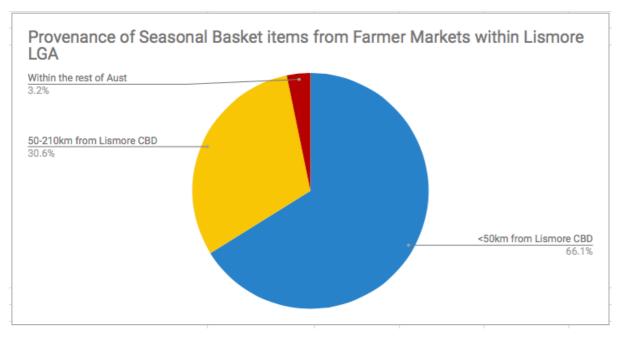


Chart 5: The chart represents the provenance of the FM seasonal basket, i.e the proportion of produce which originated within a 50kms distance from Lismore CBD. About 2/3 of produce (66.1%) was sourced from locations <50km from Lismore CBD, 30.6% sourced between 50-210km and 3.2% within Australia greater than 210km away from Lismore CBD.

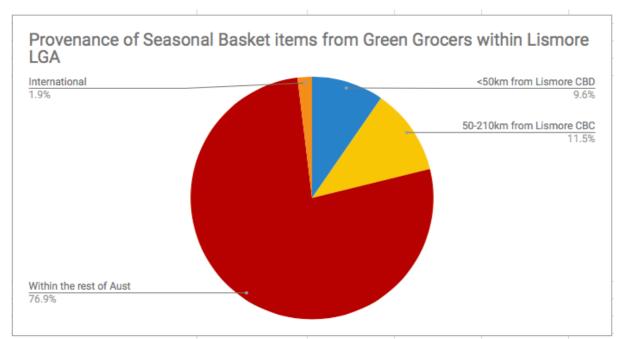


Chart 6: The chart represents the provenance of the GG seasonal basket i.e the proportion of produce grown within certain distances from Lismore CBD. Most (76.9%) of produce was sourced from locations within Australia greater than 210km away from Lismore CBD, 11.5% sourced between 50-210km, 9.6% sourced <50km from Lismore CBD and 1.9% internationally.

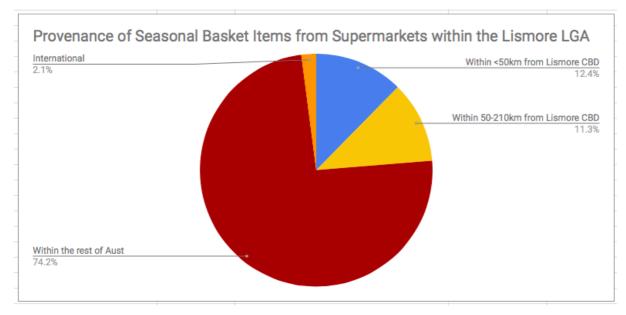
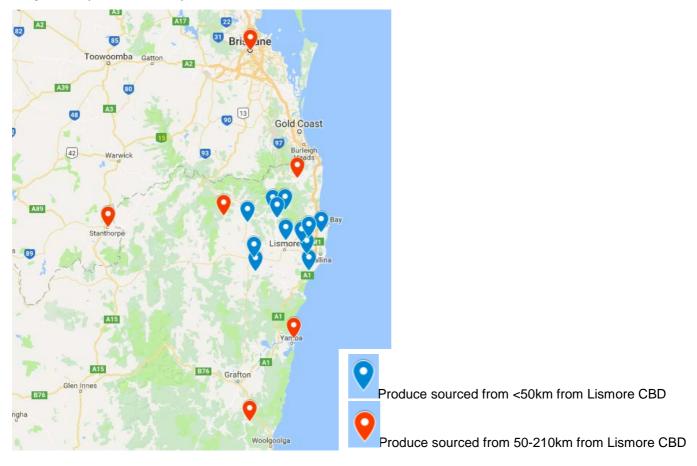
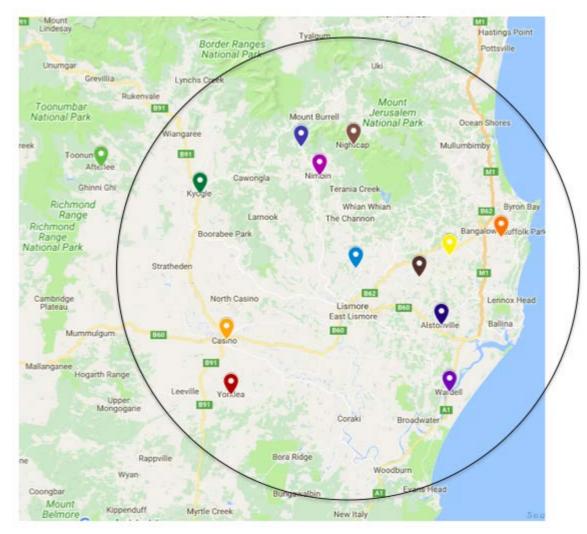


Chart 7: The chart represents the provenance of the SM seasonal basket, i.e the proportion of produce within certain distances from Lismore CBD. 74.2% of produce was source from locations within Australia greater than 210km away from Lismore CBD, 11.3% sourced between 50-210km, 12.4% source <50km and 2.1% internationally.

Map 1: Represents the provenance of the food items within the FM seasonal basket.



Map 2: A magnified version of Map 1 that shows clearly the places where FM produce was sourced within a 50km distance from Lismore CBD (markers within circle).



Accessibility and Other Factors Regarding FM

Table 1: Summary of FM contextual factors

	Tues. Organic Market Lismore	Thurs evening Market Lismore	Sat. Market Lismore	Sun. Carboot market Lismore	Nimbin (wed 3-6)	Saturday. Blue Knob
Free parking	Y	Y	Y	Y	Y	Y
Undercover	Y	N	Y	Y	N	Y
EFTPOS available	Υ	N	Y	N	N	N
ATM avilable	N	N	N	N	N	N
Wheelchair access	Y	Y	Y	Y	Y	Y
km from CBD	2	1.5	2	0.29	0	6
Km of Closest bus stop	1	1	1	0.18	0.2	6
Number of stalls	8	<15	30	>200	11	8
Length of operating hours	7-11:30am	2:30-6pm	8-11:30am . Kids entertainment .	7:30-2pm	3-6pm	8:30-12pm
	. busker present		busker . Seatin	. Family orientated		. Art gallery and
Other	.seating area	. Live music .cafe	area	. Buskers	. Live music	cafe

Table 1 collates important information perceived to enable or prevent individuals from shopping at FM. All of the FM have free parking and 4 out of 6 are held undercover. EFTPOS is available at 2 out of 6 FM and no ATM is available at any. All FM are wheelchair accessible and all FM are less than 6km away from a CBD (Lismore CBD for the Lismore markets and Nimbin CBD for the Nimbin and Blue Knob markets) with the smallest distance being Nimbin and the largest distance being Blue Knob. The FM with the closest bus stop is Lismore Sunday Car-boot Market with a distance of 180 metres and the furthest being Saturday Blue Knob, which is 6km away from a bus stop. The number of stalls including food, arts and crafts, per market range from 8-200. The smallest market was Lismore Organic Market and Blue Knob market with a total of 8 stalls. The largest was Lismore Car-boot market with >200 stalls.

The length of operating hours were mainly morning to midday (7-11:30am, 8-11:30am, 7:30-2pm, 8:30-12pm) with 2 out of the 6 markets running during the afternoon-evening 2:30-6pm and 3-6pm. FM were available on 5 days of the week, but only on 3 days in Lismore and 2 days in the Nimbin area.

Discussion

Affordability

Many people believe that FM are an expensive place to shop over SM (Claro 2011; Mount, 2010). However, the findings of this report would suggest that seasonal produce from the FM are not as expensive as they're perceived to be. Chart 1 highlights that SM sell the cheapest produce with the total seasonal basket costing \$187. However, the \$26 price difference between FM and SM seasonal basket is largely due to the differences in the prices of one dairy product and one meat product. So, buying only cheaper meat and dairy products at the FM, or buying meat and dairy from SM and the rest of the produce in FM, will cost the same as buying all produce in SM.

In wanting to buy all products on offer, the choice to purchase produce in FM only may be more feasible for a middle-high income family. However, an ABS (2017), report found households spend ~40-45% of weekly household spending on discretionary goods and service, including alcohol and tobacco. Thus, a shift in consumer behaviour towards healthy eating of local produce could lead to more families being able to buy FM produce regularly while enjoying other benefits of the FM, such as social engagement and entertainment.

When separating the produce into food categories (fruit, bread, vegetables, meat (including tofu and eggs as vegetarian sources of protein), dairy, nuts and honey)) and comparing the SM prices of each food group with FM (chart 2) and GG (chart 3), it is clear where these variances in prices lie. An analysis of chart 2 reveals that the cost of fruit, bread and honey in the SM were of similar value to FM. Additionally, it highlights that nuts and vegetables are approximately \$10 cheaper at FM whilst meat, and dairy are approx. \$14.50 and \$27.50 more expensive, respectively. However, the differences in price between these food categories, which are comprised of 5 and 3 items respectively, were mainly due to one item. In the meat category, chicken breast difference made more than 50% of the variance and in the dairy group, cheese made 63% of the price difference. If people are on limited budgets, they could avoid these specific items and the price difference between the FM and SM baskets will shrink from \$26 to \$7.

Similarly, in chart 3, the price of fruit, bread and honey were relatively the same value between SM and GG. However, unlike FM the prices of vegetables and nuts were higher in GG (approx. +\$7 and +\$28, respectively) as too, were dairy produce (approx. +\$9) and meat, tofu, eggs (approx. +\$28). Possible reasons for these findings include the smaller variety available at GG compared to SM, smaller scale wholesale purchasing and higher end speciality products e.g. locally crafted/artisan products compared to generic supermarket brands. Interestingly, across all three retail environments, the seasonal basket would be cheaper for those following a vegetarian/vegan diet (meat and dairy categories excluded). It should be noted, however, this particular basket does not cater for the total nutritional needs of a vegetarian diet and excludes important sources of animal replacement protein eg legumes.

Organics

Growing interest in organic agriculture has prompted numerous studies that compare various aspects of organic and conventionally produced foods. Despite popular belief, previous studies have shown that organic produce can be cheaper at FM compared to SM (Claro, 2011). Chart 4, which highlights the price comparison between non-organic/conventional and organic fruit and vegetable produce from both FM and SM, confirms this finding. As expected, the organic produce from each site was more expensive than conventional produce (Both FM and SM organics cost approximately double the price of conventional produce). When comparing organic produce specifically, the FM produce was found to be cheaper than SM produce, although this difference was relatively small (\$8), these findings support the perception that organic produce at FM is cheaper than that at SM. It should be noted that SM offer a greater variety of consistent organic produce than FM. However, one FM (Lismore Organic Markets) does provide solely certified

organic produce weekly which are not overly packaged as they are in SM (Australian Organic, 2018). Interestingly, there were no organic fruit or vegetables in GG due to lack of supply.

Provenance/Origin

Chart 5 shows that the majority of FM seasonal basket produce (66%) was sourced within 50km travel distance from Lismore CBD. The majority of the produce (around 75%) from both SM and GG was obtained on a national level. For both GG (Chart 6) and SM (Chart 7), only approximately 12% of the produce was sourced within a 50km radius from Lismore CBD. These findings indicate that there was approximately five times more local produce at FM compared to both GG and SM. Interestingly, all of the local (<50kms) produce in SM were found in Foodworks and SPAR, which are smaller independent supermarkets. However, these items were chicken breast and rump and were sourced from a local butcher in Lismore, rendering the origin of this produce unknown.

Both GG and SM charts showed almost identical percentages, indicating that there is no significant difference between the source of food between these two retail environments for the seasonal basket. It should be noted, however, that not all locations of origin were able to be identified to a level of accuracy that is greater than merely a state within Australia, let alone within the country itself. This was largely due to uninformed staff members or an unidentifiable place of origin on packaging in GG and SM. Conversely, many FM stall holders were the growers of the produce at FM, thus, a more accurate understanding of the produce's place of growing was obtainable here. A small percentage of produce was internationally sourced by GG and SM; these were tofu from Woolworths and honey from ALDI as well as artisan cheeses from Pirlo's. Although the large array of cheeses from Pirlo's is not only from Australia, it allows for broader appreciation and trial of authentic foods from different cultures and is consistent with the grocer's focus on delicatessen items.

Parking

All FM have free parking available although some market such as markets Lismore Organic FM, Lismore Saturday FM and Lismore Car-boot market had approximately 50+ parking spaces, whilst others like Lismore Thursday FM and Nimbin FM had time restricted <2hr parking availability along the surrounding streets, due to the market being held in the town centre. The Blue Knob FM had the least parking spaces with approximately 15-20 designated car parking spaces at its location, however this was deemed to be a sufficient amount due to the small market size and its rural location. Therefore, the plentiful nature of the parking environment at each of the FMs should not act as a barrier for shopping at FM.

Shelter

Shelter is an important element when considering the enablers/barriers for shopping at FM. There is evidence to suggest that people enjoy the FM shopping experience partly due to the venue being outdoors in fresh air (Woodburn, 2014). However, as weather can be unpredictable, it's advantageous for FM to have shelter from wet weather and harsh sunlight exposure. This study found that half of the FM in the Lismore LGA (table 1) had a permanent structure to protect shoppers from these unfavourable conditions. Nimbin FM and Blue Knob FM were the only markets not to be located on a flat cemented surface.

Accessibility: distance from CBD and public transport

Distance can play a role in where people shop for their food (Woodburn, 2014). Fortunately, all of the markets in Lismore, were located <2km from Lismore CBD, making them very accessible by foot, bike or vehicle. This is also true for Nimbin FM, which was located within the Nimbin CBD. Furthermore, there is sufficient public transport available to five of these markets with a bus stop located within a distance of <1km from the CBD and the FM themselves (table 1). Walking this distance ultimately provides an opportunity for healthy physical movement, of which 31.5% of Australians aren't getting enough of (ABS, 2012). There was no public transportation to and from Blue Knob FM from either CBD. There is wheelchair accessibility at each of the FM within Lismore LGA.

Operating hours

One of the most commonly reported barriers against shopping at FM in regards to its physical environment, is the limited hours of operation (Woodburn, 2014). SM and GG are open for 8-14 hours every day, making shopping at SM more convenient for people not able to attend FM during their various operating hours. Interestingly, FM within the Lismore LGA operate from as short as 3hrs to as long as 6.5hrs, with a market running 5/7 days a week (table 1). Due to there being plentiful FM available within the Lismore LGA during the week and on weekends, there is less need to rely on the convenience of SM

EFTPOS

In recent years, many people prefer to use card over cash (Hutchens, 2015). However only a handful of stalls offer EFTPOS across all FM and only 3 of the markets have an ATM within walking distance (table 1). This lack of EFTPOS machine availability could act as a barrier towards people shopping at FM, since the option to use card isn't directly available as it is in SM and GG.

Hence, it is suggested that customers of FM come prepared to pay in cash rather than card to assist in avoiding these complications.

Number of stalls

Variety is key to meeting the body's nutritional needs, therefore a nutritionally complete FM would need to provide sources of protein, grains, fruits, vegetables and dairy (NHMRC, 2013). However, it is common for FM to also sell homemade bakery goods and specialty food products as well as antiques, gifts and other knick-knacks (Woodburn, 2014). The largest FM in this study was the Lismore Car-boot Market. This large abundance of stall varieties attracted the largest crowd of all the markets. The FM with smaller stall numbers ranged from 8 (Blue Knob FM) - 30 (Lismore Saturday FM). The majority of these smaller markets stalls sold predominantly fresh food and food products.

Sense of Community

One of the biggest motivating factors for shopping at FM over SM and GG is the opportunity it brings for socialising with family, friends and the wider community (Woodburn, 2014). Each FM included a seating area, live music with one FM even providing entertainment for children via a jumping castle. Overall, FM stall owners seemed very friendly and engaging with customers and between other stall holders and were passionate about the produce they sell. This acts as an advantage over SM as the environment is more conducive for socialising, entertaining and engaging with sellers than SM.

Limitations

- During the data collection, only a small sample size of six FM, five SM and three GG could be included in the study and may not be representative of all the three retail environments in the area.
- Basket items found initially at FM were compared with like produce and food products in SM and GG. Because the majority of the produce from FM were sold as 'artisan' quality, they were compared with similar quality food items in SM and GG. This meant that the cheapest produce/food product e.g. home brand bread from SM and GG was not necessarily recorded, unless it was a similar product compared to the breads found at FM, or there were no similar products to compare with. This makes the produce in the baskets not representative of the cheapest possible food categories in SM and GG.
- Conducting the project in between seasons may not be as representative of the cost and availability of produce during mid-season. The basket represents produce that was seasonally grown in summer, however this study began at the beginning of Autumn. This may have influenced the price of the selected produce to be more expensive compared to mid-season prices when produce was more abundant. However, it is likely that this factor affected FM, SM and GG.
- The basket produce selected included all food groups from the Australian Guide to Healthy Eating. No basket variations were made for those prescribing to other lifestyle diets eg vegetarian or vegan, nor were they inclusive of other cultural cuisines.
- The basket used is not representative of a complete grocery basket for a family of x members to live off for x days/week. Rather it focuses on the cost of the produce/kg for easy comparability. Thus, the findings of the research may need to be interpreted further to enable consumers to calculate how long such a basket will last in their family.
- Produce included in baskets were partly selected based on availability of the produce from the first few FM, not after data was collected from all FM. This meant that non-seasonal food groups such as pasta, rice and cereal from grains group were not included in the overall basket as they were not available at the first three FM. The assumption was made that if the first three FM did not have the produce, then the remaining FM also wouldn't have it, and thus, be excluded from the basket. It was later found that these grain based foods were available at other markets, however due to time restraints, students were not able to return to the initial FM to collect this information and incorporate this food into the final baskets.
- There was no further exploration to validate the produce origin, such as farm visits and audits. This was due to time constraints. The FM stall holders were believed to be honest

and genuine, as they engaged in conversation and provided detailed description of the source of foods.

Recommendations

Red Cross and the NNSW Health Promotion unit to use the findings to promote shopping in FM to the general public as a way to get healthy, locally grown, affordable food and support local growers.

Create an infographic that supports farmers' markets and publicise their availability, as well as informing community members where to purchase the most affordable and local seasonal produce.

Recommendations for further research

Seasonal basket

Selection of specific seasonal produce to include in the final basket should be made once seasonal produce data is gathered from all FM, to ensure all foods from all food categories can be included if they are available.

Commence data collection mid-season i.e middle of summer to maximise the representativeness of the cost and availability of seasonal produce within the area.

Include alternative baskets for a variety of lifestyle and therapeutic diets eg vegetarian or vegan in order for this study to be received meaningfully by a wider audience. Eg if vegetarian, separate animal and non-animal proteins.

To create a basket of items that resembled what a family would consume in a week was outside the scope of this project but has been identified for future research as it would provide an easy to understand guide for consumers' price expectations of each of the retail environments.

Data collection

Collect data at FM on days with good weather (no rain or wind) as more stalls are likely to be present which will ultimately maximise data collection.

Sample size

Increase the sample size of the study to include all of the FM within the Northern Rivers, or replicate this study design within each LGA of the Northern Rivers to collectively analyse the entire area. Aim to include an even amount of SM and GG either by scale or number of stores to enhance the representativeness of each retail environment.

Conclusion

These findings challenge the perception that cost of produce at FM is much higher than SM and highlights the large prevalence of local produce available at FM compared to both SM and GG.

These findings can empower organisations such as Red Cross and NSW Health Promotion to inform individuals and communities, including those who are financially vulnerable, where to access affordable, local, seasonal and nutritious food. As such, shoppers who prioritise sustainable food systems and support local food supply could purchase the seasonal basket at FM. For those who are limited financially, yet still value locality and sustainability, purchasing some items from the seasonal basket (fruit, vegetables, tofu, nuts and honey) will be the same, if not more affordable at FM whilst meat and dairy produce may be more affordable at SM. Future studies of similar nature should aim to broaden the contents of the seasonal basket items to be more representative of a grocery basket that can sustain a family for a week, in order to produce more meaningful outcomes of the project.

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Appendices

Appendix 1 - Market Guide

3rd WEEKEND OF THE MONTH

Lismore Car Boot Market Lismore Shopping Square, Uralba St (all weather) 0437 995 859 (Marny) 1st and 3rd Sunday 7.30am - 2pm (exc. 3rd Sun in Dec)

Ballina Market Circus Ground, Canal Rd, Ballina 02 6686 4546 3rd Sunday 7am - 1pm

Mullumbimby Community Market Stuart St, Mullumbimby 02 6684 3370 3rd Saturday 7.30am - 3pm

Makers & Finders Market Knox Park Brisbane St, Murwillumbah 0413 804 024 3rd Saturday 9am - 3pm

Uki Buttery Bazaar Market (North of Nimbin) Uki Village Buttery, Uki 0487 329 150 (Lisa) 3rd Sunday 8am - 2pm

4th WEEKEND OF THE MONTH

Nimbin Market Nimbin Community Centre, Cullen St, Nimbin (if raining in Hall) 0458 506 000 (Steph) 4th and 5th Sunday 8am - 3pm

Bangalow Market Bangalow Showgrounds, Bangalow 02 6687 1911 4th Sunday 9am - 3pm

Evans Head Riverside Market Recreation reserve, Evans Head 0435 008 092 4th Saturday 7.30am - 1.30pm

Murwillumbah Market Murwillumbah Showground 0422 565 168 4th Sunday 8am - 1pm

Kyogle bazaar Amphitheatre, Kyogle Visitors Centre 0458 698 588 (Sandy) 4th Sunday 8am-2pm



5th WEEKEND OF THE MONTH

Sth WEEKEND OF THE MUNITH Nimbin Market Nimbin Community Centre, Cullen Street, Nimbin (fraining in Nimbin Hall) 0458 506 000 w: facebook.com/nimbinmarkets 4th and 5th Sundays 8am - 3pm

Lennox Community Market Lennox Head Community Centre, Park Lane, Lennox Head 0419 369 609 (Mike) e:lennoxmarket@gmail.com 2nd and Sth Sundays Sam - 2pm





Lismore Visitor Centre p 02 6626 0100 w visitlismore.com.au







WEEKLY MARKETS Lismore Produce Market Magellan St (between Carrington & Molesworth St, Lismore CBD) 0450 688 900 (Peter Wells) Every Thursday 2.30pm - 6pm

Lismore Organic Market Lismore Showground, North Lismore w: tropo.org.au Every Tuesday 7.30am - 11:30am

Lismore Farmers Market Lismore Showground, North Lismore 0466 415 172 Every Saturday 8am - 11.30am

Nimbin Farmers Market Next to The Green Bank, Cullen St, Nimbin 0458 506 000 (Steph) Every Wednesday 3pm - 6pm

Blue Knob Farmers Market Blue Knob Café and Gallery, 719 Blue Knob Rd, Lillian Rock 0433 551 436 Every Saturday 8.30am - 12pm

Ballina Missingham Farmers Market Missingham Park, Kingsford Smith Dve, Ballina 0478 055 657 (Mike) Every Sunday 6am - 12pm

Kyogle Farmers Market Stratheden St, Kyogle 0403 628 292 (Rupert) Every Saturday 8am-12pm

WEEKLY MARKETS continued...

WEEKLT MARKETS CONDUCE... Byron & Bangalow Farmers Market Butler Street Reserve, Byron Bay & behind The Bangalow Hotel, Bangalow 20 6687 1137 w: byronfarmersmarket.com.au Byron Every Thu Bam-11am, Bangalow Every Sat Bam-11am

Murwillumbah Farmers Market Murwillumbah Showground 0498 733 766 www.murwillumbahfarmersmarket.com.au Every Wednesday 7am - 11am

Mullumbimby Farmers Market Mullumbindy Showground, 51 Main Arm Rd 02 6677 1345 w: mullumfarmersmarket.org.au Every Friday 7am - 11am

Uki Produce Market Uki Hall, Uki 02 6679 5438 (Anita) Every Saturday 8am - 12pm

Byron Bay Saturday Artisan Market Raiway Park, Jonson St Byron Bay 02 6685 6807 (Tess Cullen) w: byronmarkets.com.au/artisan.html from October- Easter only, Saturday 4pm - 9pm



1st WEEKEND OF THE MONTH

Lismore Vintage & Handmade Market 152 Keen St, Lismore 0408 208 583 e: lismorehandmade@gmail.com 1st Saturday 10am - 2pm

Lismore Car Boot Market Lismore Shopping Square, Uralba St, Lismore (All weather) 0437 995 859 (Marny) Ist and Jrd Sundays 7.30am - 2pm (exc. 3rd Sun in Dec)

Brunswick Heads Market Memorial Park (behind Ampol Service Station) 02 6628 4495 1st Saturday 7.30am - 2pm

Byron Community Market Butler St. Reserve, Byron Bay 02 6685 6807 w: byronmarkets.com.au 1st Sunday Bam - 3pm (+ 3rd Sunday Dec - Jan)



2nd WEEKEND OF THE MONTH The Channon Craft Market Coronation Park, The Channon 02 6688 6433 w: thechannonmarket.org.au 2nd Sunday 9am - 3pm

Lennox Community Market Lennox Head Community Centre, Park Ln, Lennox Head 0419 369 609 (Mike) e: lennoxmarket@gmail.com 2nd and 5th Sunday 8am - 2pm

Chillingham Market Chillingham Community Centre, Chillingham 0428793141 w: chillingham.org.au/markets 2nd Sunday 8am - 1pm

Byron Flea Market Gilmore Ct, Byron Bay 0490 026 840 (Berri) 2nd Saturday 8am - 1pm

Appendix 2 - Byron Bay

SUMMER PRODUCE

Growing seasons can vary from farm to farm within our region. Each farm has its own microclimate and some of our farmers use greenhouses to extend their growing season. Here is a guide to the fresh seaonsonal produce available at Byron and Bangalow Farmers Markets.



https://www.byronfarmersmarket.com.au/in-season.html

Appendix 3: Seasonal Basket- FM, SM, GG, Price per kg

			Su	permarket		
	FM		s		Gro	ocery
Bananas	\$	2.00	\$	3.00	\$	2.00
Apples	\$	3.50	\$	3.00	\$	3.00
Grapes (red and						
green)	\$	5.00	\$	4.00	\$	5.00
Potatoes - creme						
royale	\$	2.00	\$	1.50	\$	2.00
Capsicum	\$	2.50	\$	5.00	\$	6.00
tomatoes	\$	3.00	\$	4.00	\$	5.00
carrot	\$	2.00	\$	1.50	\$	2.50
Lettuce bunch	\$	10.00	\$	16.50	\$	20.00
Tofu	\$	6.50	\$	7.00	\$	11.50
Chicken Breast	\$	17.00	\$	9.00	\$	9.00
Steak - rump	\$	17.50	\$	15.00	\$	27.00
fish/whole/fresh	\$	20.00	\$	16.00	\$	25.00
Eggs -Free range	\$	7.50	\$	6.00	\$	6.00
Full Cream milk	\$	2.50	\$	1.00	\$	1.00
Cheese	\$	28.00	\$	7.00	\$	11.50
Yoghurt	\$	9.00	\$	4.00	\$	8.00
Multigrain	\$	3.50	\$	2.00	\$	2.50
Honey	\$	10.00	\$	12.00	\$	10.00
Macadamias	\$	33.00	\$	44.50	\$	45.00
Pecans	\$	28.00	\$	25.00	\$	50.00
Total Basket Price	\$	212.50	\$	187.00	\$	252.00

Appendix 4: Organic Basket, Price per kg

	FM conventional		FM Organic		Supermarket Conventional		Supermarket Organic	
<u>Bananas</u>	\$	2.50	\$	2.00	\$	3.00	\$4.50	
Apples	\$	3.50	\$	7.00	\$	3.00	\$7	
Grapes	\$	5.00	\$	6.00	\$	4.00	\$10	
Capsicum	\$	2.50	\$	8.00	\$	5.00	\$10	
Carrots	\$	2.00	\$	3.00	\$	1.50	\$4.50	
Lettuce bunch	\$	10.00	\$	24.00	\$	16.50	\$32	
	Total							
	\$	25.50	\$	50.00	\$	33.00	\$58	