**SUPPLEMENTARY MATERIAL:**

**Streamlined data-gathering techniques to estimate the price and affordability of healthy and unhealthy diets under different pricing scenarios.**

**INSICATIVE LOW DISPOSABLE INCOME CALCULATIONS**

**Table S1.** Assumptions underlying the calculation of indicative low (minimum) disposable household income, in accordance with the ASAP methods (1).

|  |  |
| --- | --- |
| Reference household persons | 1 male aged between 31-50 years, 1 female aged between 31-50 years, 1 male child aged 14 years and 1 female child aged 8 years. |
| Paid employment: adult male | Minimum wage is $719.20 per 38-hour week (permanent full-time) (2). |
| Paid employment: adult female | Minimum wage is 18.93 per hour for 6-hour week (part-time) (2). |
| Family Tax Benefit A | Biweekly payment ($420.70); annual supplement payment ($737.30 per child) (3). |
| Family Tax Benefit B | Biweekly payment ($106.40); annual supplement payment ($357.70 per family) (4). |
| Total clean energy supplement | Maximum biweekly rate for Family Tax Benefit A ($3.50 for each child >13 years old, $4.48 for each child 13-19 years old) and Family Tax Benefit B ($1.96 for each child 5-6 years old) (5). |
| Rent assistance | Biweekly payment ($159.60 for all SA2s except for one regional area where rent assistance was calculated to be $146.02) (6). |
| Income tax paid | Allowing for low income tax offset ($445.00 annual rebate for adult female; annual income tax of $3701.00 – annual tax offset of $439.02 for adult male) (7). Subtracted from all income and payment sources. |

**References:**

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3. Australian Government. Department of Human Services. FTB Part A payment rates. Available from: <https://www.humanservices.gov.au/individuals/services/centrelink/family-tax-benefit/how-much-you-can-get/ftb-part-payment-rates> (updated 23 October 2018, accessed 26 February 2019).
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5. Australian Government. Department of Human Services. Energy Supplement. Available from: <https://www.humanservices.gov.au/individuals/services/centrelink/energy-supplement> (updated 17 January 2019, accessed 26 February 2019).
6. Australian Government. Department of Human Services. How much Rent Assistance you can get. Available from: <https://www.humanservices.gov.au/individuals/enablers/how-much-rent-assistance-you-can-get/38861> (updated 20 September 2018, accessed 26 February 2019).
7. Australian Government. Australian Taxation Office. Available from: <https://www.ato.gov.au/individuals/income-and-deductions/offsets-and-rebates/low-income-earners/> (updated 29 June 2018, available 26 February 2019).

**AGREEMENT BETWEEN STREAMLINED AND IN-STORE METHODS**

**Table S2a.** Mean overall, price, price promotion and availability agreements (expressed as a percentage) for food and beverage items surveyed using traditional in-store and streamlined data collection methods, across different food retailers.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Food retailer type* | n stores (total) | % overall agreement (SD) | % price agreement  (SD) | % price promotion agreement  (SD) | % availability agreement (SD) |
| Supermarkets | 16 | 94.2 (3.1) | 99.1 (0.9) | 97.9 (1.6) | 97.3 (1.6) |
| *Store A* | 8 | 92.2 (2.8) | 98.7 (1.0) | 96.6 (0.7) | 96.9 (1.9) |
| *Store B* | 8 | 96.4 (1.6) | 99.4 (0.7) | 99.1 (1.3) | 97.7 (1.1) |
| Alcohol | 16 | 64.1 (17.7) | 100.0 (0.0) | 77.6 (10.7) | 86.5 (8.3) |
| Fast foods | 16 | 87.5 (23.2) | 87.5 (23.2) | 100.0 (0.0) | 100.0 (0.0) |

Note: These results were not calculated for bakeries and fish and chip stores as it was assumed that retailers accurately reported prices displayed in-store (i.e. 100% agreement assumed).

**Table S2b.** Mean overall, price, price promotion and availability agreements (expressed as a percentage) between food and beverage items surveyed using traditional in-store and streamlined data collection methods, by supermarket food and beverage categories (n=107 items per store).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | n items (mean) | % overall agreement (SD) | % price agreement (SD) | % price promotion agreement (SD) | % availability agreement (SD) |
| **Core** | 68 | 94.6  (2.6) | 98.6  (1.4) | 99.4  (1.5) | 96.5  (2.0) |
| Water | 1 | 81.3  (40.3) | 93.8  (25.0) | 93.8  (25.0) | 81.3  (40.3) |
| Fruit | 3 | 77.1  (26.4) | 87.5  (16.7) | 93.8  (18.1) | 95.8  (11.4) |
| Vegetables and legumes | 20 | 94.4  (4.0) | 98.4  (2.4) | 99.4  (2.5) | 97.2  (3.2) |
| Grain (cereal) foods | 16 | 98.4  (3.7) | 100.0  (0.0) | 100.0  (0.0) | 98.4  (3.7) |
| Lean meats and poultry, fish, eggs, nuts and seeds | 7 | 93.8  (7.3) | 97.3  (5.8) | 99.1  (3.6) | 97.3  (5.8) |
| Milk, yoghurt, cheese and alternatives | 12 | 94.0  (7.0) | 100.0  (0.0) | 100.0  (0.0) | 94.0  (7.0) |
| Unsaturated oils and spreads | 6 | 94.8  (10.0) | 100.0  (0.0) | 99.0  (4.2) | 95.8  (9.6) |
| **Discretionary** | 40 | 93.6  (4.9) | 99.7  (0.7) | 95.8  (4.8) | 98.1  (1.8) |
| Other | 3 | 95.8  (11.4) | 97.9  (8.3) | 100.0  (0.0) | 97.9  (8.3) |
| **All items (i.e. overall)** | 107 | 94.3  (3.1) | 99.1  (0.9) | 97.9  (1.6) | 97.3  (1.6) |

\*Note: Columns and/or rows should not add to 100%.

**Table S3a.** Summary of the nature, extent and magnitude of price discrepancies observed between traditional in-store and streamlined data-gathering of food and beverage prices.

|  |  |  |  |
| --- | --- | --- | --- |
| Food and beverage item | Description of discrepancy | Number of discrepancies observed (across all stores) | Difference in price\* |
| Bananas | $4.50/kg in-store, $4.90/kg online; $3.50/kg in-store, $4.90/kg online; $2.48/kg in-store, $4.50/kg online | 6 | +$0.40 per kg, +$1.40 per kg |
| Broccoli | $3.90/kg in-store, $3.50/kg online | 4 | -$0.40 per kg |
| Carrot | $2.50/kg in-store, $2.20/kg online | 1 | -$0.30 per kg |
| Eggs | $6.00 in-store, $5.90 online | 2 | -$0.10 per item |
| Meat and vegetable casserole (canned) | $3.85 in-store, $4.00 online | 1 | +$0.15 per item |
| Frozen lasagne | Generic product: $2.29 in-store, $2.25 online | 1 | -$0.04 per item |
| Hamburger | $5.60 in-store, $5.65 online; $5.80 in-store, $5.85 online | 2 | +$0.05 per item |

\*Streamlined price is higher than the traditional approach (+), streamlined price is lower than the traditional approach (-)

**Table S3b.** Summary of the nature, extent and magnitude of price promotion discrepancies observed between traditional in-store and streamlined data-gathering of food and beverage prices.

|  |  |  |  |
| --- | --- | --- | --- |
| Food and beverage item | Description of discrepancy | Number of discrepancies observed (across all stores) | Difference in price\* |
| Apples | Cheapest non-discounted online price ($4.00/kg) is displayed in-store as a price promotion (original price: $5.00/kg); price displayed as a price promotion in-store but not online (same prices) | 2 | -$1.00 per kg |
| Oranges | Price displayed as a price promotion in-store but not online (same prices) | 1 | No change |
| Broccoli | Price displayed as a price promotion in-store but not online (same prices) | 1 | No change |
| Lettuce | Price displayed as a price promotion in-store but not online (same prices) | 1 | No change |
| Sunflower oil | Price promoted price only displayed online ($2.25); i.e. price promotion not in-store ($5.09) | 1 | +2.84 per item |
| Muesli bar | 2-for-$7 multi-buy displayed in-store but not online ($4 original price) | 7 | +$1.00 per item |
| Tomato sauce | 2-for-$5 multi-buy displayed in-store but not online ($2.95 original price) | 6 | +$0.45 per item |
| Orange juice | 2-for-$6 multi-buy displayed in-store but not online ($4.25 original price) | 8 | +$1.25 per item |
| Ham | Price promoted price only displayed online ($3.80); i.e. original price not displayed online ($4.80) | 8 | -$1.00 per item |
| Eggs | Price promoted price only displayed online ($5.70); i.e. price promotion not in-store ($6.70) | 1 | -$1.00 per item |
| Whisky | Price promoted price only displayed online ($36.00); i.e. original price not displayed online ($42.00) | 7 | -$6.00 per item |
| Red wine | Price promoted price only displayed online ($14.00); i.e. original price not displayed online ($19.00) | 7 | -$5.00 per item |

\*Streamlined price is higher than the traditional approach (+), streamlined price is lower than the traditional approach (-)

**Table S3c.** Summary of the nature, extent and magnitude of discrepancies in product availability observed between traditional in-store and streamlined data-gathering of food and beverage prices.

| Food and beverage item | Description of discrepancy | Number of discrepancies observed (across all stores) | Difference in price |
| --- | --- | --- | --- |
| Water | 600mL generic branded bottled water not available in-store but available online ($1.00); use branded product for in-store analysis ($2.35) | 1 | -$1.35 per item |
| Oranges | Oranges not available in-store; use online prices | 1 | No change |
| Bananas | Bananas not available online; use standard prices across stores | 1 | No change |
| Cabbage | Different cuts of cabbage available in-store and online, for example:   1. Cabbage half not available in-store but available online ($1.80/kg); use whole cabbage price for in-store analysis ($3.00/kg) 2. Specified cabbage type not available in-store ($2.34/half online vs. $3.00/in-store) | 9 | Variation: e.g. -$1.20 per kg, -$0.66 per item |
| Broccoli | Specified variety available online ($3.90/kg) but not in-store; use organic variety for in-store analysis ($9.50/508g) | 1 | -$14.80 |
| Peas | Generic branded peas available online ($1.60) but not in-store; use generic brand baby peas price ($1.70) for in-store analysis | 1 | -$0.10 per item |
| Milk | Specified brands not available in-store or online, use the cheapest brand (e.g. $3.20 online vs. $4.00 in-store) | 7 | Variation: e.g. -$0.80, -$0.01, +$0.20 per item |
| Cheese | Generic branded tasty cheese available online but not in-store | 1 | Increase overall in-store diet price |
| Reduced fat flavoured yoghurt | Generic branded yoghurt available online ($3.50) but not in-store; use branded item for in-store analysis ($4.00) | 3 | -$0.50 per item |
| Eggs | Specified brand not available in-store but available online ($6.00); use alternative brand for in-store analysis ($6.30) | 2 | -$0.30 per item |
| Bread | Specified brand and unit available online ($2.90) but not in-store ($3.20); also for generic option | 3 | Variation: e.g. -$0.30 per item, +$0.40 per item |
| Pasta | Generic branded pasta available online ($0.65) but not in-store; use next cheapest generic option for in-store analysis ($1.00) | 1 | -$0.35 per item |
| Margarine | Specified brand and unit size available in-store but not online ($4.50/kg). Generic branded margarine available online in specified unit size but not in-store ($2.00/500g); use price of larger margarine for in-store analysis ($1.60/1kg) | 2 | Variation: e.g. +$2.10, +$2.40 per kg |
| Sunflower oil | Branded sunflower oil available online ($5.90/750mL) but not in-store; use generic brand for in-store analysis ($2.25/750mL) | 2 | -$3.65 per item |
| Butter | Specified unit size available in-store ($2.80/250g) but not online ($5.00/500g) | 1 | -$0.60 per kg |
| Minties™ (confectionary) | Branded Minties™ available online ($3.00/150g) but not in-store; use average price from other stores for in-store analysis ($3.00/150g); only larger unit size available in-store ($5.00/370g) | 2 | No change; -$6.49 per kg |
| Muffins | Only individual muffins sold in-store ($3/200g) vs. $3.50/480g online | 1 | -$7.70 per kg |
| Lamb chops | Different cuts of lamb chops available in-store and online (loin chops in-store $14.95/kg vs. mid-loin chops online $23.00/kg) | 2 | +$8.05 per kg |
| Frozen lasagne | Cheapest generic item available online ($2.25) but not in-store; use next cheapest generic frozen lasagne for in-store analysis ($3.00) | 1 | -$0.75 per item |
| Orange juice | Generic branded orange juice available online ($2.00) but not in-store; do not include generic option for in-store analysis | 1 | Increase overall in-store diet price |
| Fruit salad (canned) | Specified brand available online ($3.70/700g) but not in-store; use generic price for in-store analysis ($2.80/825g) | 1 | -$1.89 per kg |
| Beer | Only 24-pack of beer displayed online ($49.00), 6-pack price displayed in-store ($20.00) | 6 | -$3.44 per L |

\*Streamlined price is higher than the traditional approach (+), streamlined price is lower than the traditional approach (-)

**ASSESSING METHODOLOGICAL RELIABILITY USING BLAND-ALTMAN PLOTS**

The following Bland-Altman plots were prepared using Stata 16 (1). Bland-Altman plots are the most popular method used to assess the agreement between the measures or estimates produced by two methods (2). These plots provide an indication of the difference between the estimates/measures (y-axis) and plot this difference against the average of the two estimates (x-axis). Furthermore, the plotted estimates are interpreted within upper and lower limits of agreement (typically constituting 95% limits that are 1.96 standard deviations above and below the mean difference). However, these limits are not standardised and rely on expert or ‘clinical’ interpretation (3), which we have provided below each figure.

**Figure S1.** Bland-Altman plot presenting the agreement between in-store and streamlined data-gathering techniques to estimate the price of a **healthy diet**



**Interpretation:** *The absence of a clear trend in the plotted data indicates that there is no consistent bias (i.e. over or under-estimation) in either method. Moreover, the mean difference (i.e. in-store healthy diet prices are on average $1.51 cheaper) is not ‘clinically’ significant – representing 0.3% of the average bi-weekly price of a healthy diet for the reference family. Similarly, the upper and lower limits indicate that 95% of the variance in the estimates from the two methods would be expected to be between $-22.74 and $19.71 – equating to between ~3.3% and ~3.8% of the bi-weekly average price of a healthy diet. Overall, these results support the ‘clinical’ or practical reliability of the streamlined approach to estimating healthy diet prices compared to the in-store approach.*

**Figure S2.** Bland-Altman plot presenting the agreement between in-store and streamlined data-gathering techniques to estimate the price of an **unhealthy diet**

![A screenshot of a cell phone

Description automatically generated]()

**Interpretation:** *The absence of a clear trend in the plotted data indicates that there is no consistent bias (i.e. over or under-estimation) in either method. Moreover, the mean difference (i.e. in-store prices of an unhealthy diet are on average $10.35 more expensive) is not ‘clinically significant’ – representing 1.4% of the average bi-weekly price of an unhealthy diet for the reference family. Similarly, the upper and lower limits indicate that 95% of the variance in the estimates from the two methods would be expected to be between $-14.51 and $35.21 – equating to between ~2% and ~5% of the bi-weekly average price of an unhealthy diet. Overall, these results support the ‘clinical’ or practical reliability of the streamlined approach to estimating unhealthy diet prices compared to the in-store approach.*

**References:**

1. Stata [Computer Program]. Version 16. College Station, TX, USA: StataCorp, 2019. Available from [www.stata.com](http://www.stata.com)
2. Zaki R, Bulgiba A, Ismail R, Ismail NA. Statistical Methods Used to Test for Agreement of Medical Instruments Measuring Continuous Variables in Method Comparison Studies: A Systematic Review. PLOS ONE. 2012;7(5):e37908.
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**IN-STORE ANALYSES**

**Table S4.** Mean overall price of each food and beverage category across different pricing scenarios using data collected from two supermarkets.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Healthy | | | Unhealthy | | |
| Standard | Price promotions | Generic brands | Standard | Price promotions | Generic brands |
| Overall (mean price $AUD, SD) | 594.98 (15.00) | 579.33  (14.64) | 448.50  (15.33) | 731.32  (16.03) | 704.96  (11.81) | 587.64  (19.52) |
| Water | 19.20  (1.60) | 19.20  (1.60) | 8.95  (3.60) | 19.20  (1.60) | 19.20  (1.60) | 8.95  (3.60) |
| Fruit | 89.13  (8.33) | 83.79  (5.93) | 89.13 (8.33) | 53.64  (3.60) | 49.27  (2.72) | 45.28  (3.57) |
| Vegetables and legumes | 101.58  (9.52) | 97.61  (11.31) | 86.05  (9.98) | 40.77  (2.96) | 39.41  (3.62) | 35.24  (3.27) |
| Grain (cereal) foods | 99.50  (0.46) | 98.26  (1.28) | 47.86  (2.22) | 41.60  (0.30) | 41.18  (0.47) | 21.93  (0.86) |
| Lean meats and poultry, fish, eggs, nuts and seeds | 191.88  (6.27) | 188.52  (5.52) | 146.11  (5.60) | 101.21  (2.07) | 100.18  (1.45) | 76.64  (1.67) |
| Milk, yoghurt, cheese and alternatives | 85.88  (2.49) | 83.48  (2.81) | 66.46  (3.03) | 41.09  (3.11) | 37.27  (3.57) | 31.91  (4.94) |
| Unsaturated oils and spreads | 7.80  (0.34) | 7.63  (0.39) | 3.94  (0.60) | 1.22  (0.09) | 1.15  (0.11) | 0.55  (0.20) |
| Discretionary (total) | n/a | n/a | n/a | 427.15  (13.47) | 411.67  (10.91) | 364.39  (13.91) |
| Alcohol | n/a | n/a | n/a | 90.39  (8.95) | 88.14  (6.76) | n/a |
| Fast food | n/a | n/a | n/a | 145.36  (7.94) | 145.36  (7.94) | n/a |
| Artificially sweetened soft drinks | n/a | n/a | n/a | 5.45  (0.00) | 4.64  (0.84) | n/a |
| Soft drinks | n/a | n/a | n/a | 32.84  (0.00) | 27.94  (5.06) | n/a |

**STREAMLINED ANALYSES**

**Table S5**. Mean overall price of each food and beverage category across different pricing scenarios using data collected from two supermarkets.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Healthy | | | Unhealthy | | |
| Standard | Price promotions | Generic brands | Standard | Price promotions | Generic brands |
| Overall (mean price $AUD, SD) | 596.49 (12.12) | 579.39  (3.11) | 449.52  (7.48) | 720.98  (14.47) | 699.26  (1.60) | 573.67  (19.87) |
| Water | 19.20  (1.60) | 19.20  (1.60) | 8.83  (0.00) | 19.20  (1.60) | 19.20  (0.00) | 8.83  (0.00) |
| Fruit | 92.19  (8.69) | 86.84  (3.16) | 92.19  (8.70) | 54.90  (5.07) | 51.43  (2.39) | 45.99  (5.77) |
| Vegetables and legumes | 98.40  (0.76) | 94.62  (4.11) | 82.85  (1.61) | 39.95  (0.47) | 38.64  (1.55) | 34.39  (1.04) |
| Grain (cereal) foods | 99.47  (0.45) | 98.22  (1.31) | 47.26  (0.53) | 41.57  (0.29) | 41.16  (0.49) | 21.77  (0.78) |
| Lean meats and poultry, fish, eggs, nuts and seeds | 193.90  (1.18) | 190.31  (2.78) | 148.56  (0.93) | 101.65  (1.22) | 100.54  (0.51) | 77.12  (0.76) |
| Milk, yoghurt, cheese and alternatives | 85.41  (2.56) | 82.83  (1.30) | 65.83  (2.07) | 40.96  (3.14) | 37.13  (3.53) | 31.48  (4.37) |
| Unsaturated oils and spreads | 7.93  (0.27) | 7.72  (0.29) | 4.00  (0.61) | 1.24  (0.01) | 1.16  (0.08) | 0.57  (0.19) |
| Discretionary (total) | n/a | n/a | n/a | 416.06  (9.36) | 404.90  (9.56) | 351.10  (11.27) |
| Alcohol | n/a | n/a | n/a | 77.99  (12.61) | 77.99  (12.61) | n/a |
| Fast food | n/a | n/a | n/a | 145.36  (7.94) | 145.36  (7.94) | n/a |
| Artificially sweetened soft drinks | n/a | n/a | n/a | 5.45  (0.00) | 4.64  (0.84) | 3.69  (2.06) |
| Soft drinks | n/a | n/a | n/a | 32.84  (0.00) | 27.94  (5.06) | 21.81  (12.27) |