

1 **Investigating business outcomes of healthy food retail strategies: a systematic scoping**
2 **review**

3 **Abstract**

4 Large changes to food retail settings are required to improve population diet. However, limited
5 research has comprehensively considered the business implications of healthy food retail
6 strategies for food retailers. We performed a systematic scoping review to identify types of
7 business outcomes that have been reported in healthy food retail strategy evaluations. Peer-
8 reviewed and grey literature were searched. We identified qualitative or quantitative real-world
9 food or beverage retail strategies designed to improve the healthiness of the consumer nutrition
10 environment (e.g. changes to the “marketing mix” of product, price, promotion and/or
11 placement). Eligible studies reported store- or chain-level outcomes for measures of
12 commercial viability, retailer perspectives, customer perspectives and/or community
13 outcomes. 11,682 titles and abstracts were screened with 107 studies included for review from
14 15 countries. Overall item sales, revenue, store patronage, and customer level of satisfaction
15 with strategy were the most frequently examined outcomes. There was large heterogeneity in
16 outcome measures reported and in favourability for retailers of outcomes across studies. We
17 recommend more consistent reporting of business outcomes and increased development and
18 use of validated and reliable measurement tools. This may help generate more robust research
19 evidence to aid retailers and policy-makers to select feasible and sustainable healthy food retail
20 strategies to benefit population health within and across countries.

21

22 **Keywords:** retail, consumer, process, food environment, consumer welfare, economic analysis

- 23 **Abbreviations:** WHO, World Health Organisation; SSBs, sugar-sweetened beverages;
- 24 MMAT, Mixed Method Appraisal Tool; OECD, Organization for Economic Co-operation and
- 25 Development; RCT, Randomised Control Trial.

26 **Introduction**

27 The World Health Organisation (WHO) and many governments around the world have set
28 ambitious targets to reduce the burden from non-communicable disease including “[halting]
29 the rise in diabetes and obesity” by 2020 ¹. There is now wide acceptance that changes in the
30 food environment will be instrumental in achieving these goals ². Indeed, the WHO has urged
31 governments to “develop policy measures that engage food retailers and caterers to improve
32 the availability, affordability and acceptability of healthier food products” ¹.

33 In addition to policy measures, there has been increasing interest in food retail environment
34 changes, with several reviews having investigated the many ways in which retailers can
35 encourage healthier customer purchases ³⁻⁷. In particular, retailers can influence the consumer
36 nutrition environment⁷, including utilising the traditional “marketing mix” of product, price,
37 promotion and placement of food and beverages⁸. To date, evaluations of these strategies have
38 largely focused on their impact on customer purchases or the actual changes to the consumer
39 nutrition environment ^{3,9-11}. There are comprehensive existing guidelines for the evaluation of
40 the direct effect of healthy food retail strategies on nutrition and health outcomes ^{12,13}, with the
41 assumption that measurable changes in the food environment lead to changes in purchase and
42 therefore changes in consumption and health outcomes ¹⁴.

43 The nutrition outcomes of healthy food retail strategies may be influenced by business
44 outcomes. Broadly, we consider business outcomes to include outcomes which may affect
45 retailers’ likelihood of implementing and sustaining a healthy food retail strategy - namely
46 commercial viability, customer and retailer perspectives, and community outcomes (**Table 1**).
47 Business outcomes may be directly affected by changes in purchasing, which in turn may act
48 as barriers or enablers to implementation and sustainability of strategies. The conceptual
49 framework for this review can be found in **Appendix I**. The traditionally acknowledged
50 ‘mechanism’ of effect from a change in food environment to a change in purchasing and

51 ultimately health outcomes is influenced by numerous ‘contextual factors’¹⁵⁻¹⁷. For example,
52 in a traditional linear pathway of effect, an increase in price of sugar-sweetened beverages
53 (SSBs) in a convenience store may reduce purchases of SSBs, and increase purchases of bottled
54 water^{18,19}, which may in turn lead to reduced customer SSB consumption and reduced
55 community risk of obesity. Integrating business outcomes into the effect path, customer store
56 satisfaction may decrease with SSB price increases, which may reduce store patronage and in
57 turn reduce customer purchases of SSBs and healthy alternatives at the convenience store. This
58 may lead to a reduction in profit, which leads the retailer to remove the price increase on SSBs.
59 Thus the potential community health behaviour and health outcome benefits of the SSB price
60 increase (e.g. decreased rates of obesity or tooth decay) may not be fully realised.

61 Many retailers acknowledge and value the potential health impact of their food outlet in their
62 community¹⁹⁻²². However, for retail store staff, managers, owners and customers, business
63 outcomes may be just as, or more, important than health outcomes when assessing the ‘success’
64 of a healthy food retail strategy, and therefore whether the strategy is feasible and sustainable.
65 For retailers, perceptions of customer acceptability^{22,23}, the effect on business profits^{20,22}, and
66 relationships with suppliers and buyers groups¹⁹ may be key variables in determining strategy
67 ‘success’^{24,25}. Risk of adverse outcomes may discourage retailers from implementing such
68 changes¹⁹. A holistic understanding of business outcomes of healthy food retail strategies
69 therefore encompasses community outcomes, customer perspectives and retailer perspectives,
70 as well as commercial viability outcomes.

71 We are aware of only five reviews to date that have examined business outcomes of healthy
72 food retail strategies using one or more of the strategies of the traditional marketing mix
73 framework. None have examined a broad range of business outcomes and how they may
74 influence the implementation of healthy food retail strategies. A systematic review by Grech
75 et al. synthesised profitability outcomes of healthier vending machine strategies²⁶, which

76 suggested strategies that altered availability may result in reduced profits only where there is
77 surrounding competition. Further, Hillier-Brown et al. examined the impact of healthier ready-
78 to-eat meal strategies (mainly calorie labelling) on healthiness of customer purchases and store-
79 level outcomes ²⁷. Although the authors included profitability measures (a business outcome)
80 in their search, no overall profit or sales measures were reported. Gittelsohn et al. ²⁸ examined
81 outcomes of healthy food retail strategies in small stores, and extracted information on
82 “consumer psychosocial factors”, of which three studies examined attitudes towards stocking
83 healthier foods. Retailer perspectives and commercial viability outcomes of these strategies
84 were not examined. Gittelsohn et al. ²⁹ conducted a further review focused on sales, purchasing
85 and consumption effects of retail pricing interventions and noted that four included studies
86 found improved revenue or total profits. Kraak et al. ³⁰ conducted a review examining a wider
87 range of interventions in restaurants, both marketing mix and other choice architecture changes.
88 Several studies demonstrated number of customer transactions and/or revenue were unaffected,
89 and moderate customer acceptance of healthy default choices. Two further reviews have
90 examined selected actual or anticipated business outcomes of healthy food retail strategies and
91 noted characteristics of successful strategies included retailer approval (largely dependent on
92 profitability), customer engagement with the strategy ³¹, and customer demand ³². A systematic
93 review of healthy grocery store and supermarket strategies by Cameron et al. ³³ (2016) found
94 no studies that examined economic impact of strategies. No review to date has synthesised the
95 measurement of a holistic range of business outcomes of healthy food retail initiatives across
96 a range of retail settings. There is a clear gap in the literature comprehensively summarising
97 the business outcomes that may present barriers or enablers to engaging retailers in the
98 initiation and maintenance of healthy food retail strategies.

99 Our primary research question was “What types of business outcomes of healthy food and
100 beverage retail strategies have been reported between 1997 and 2017?” Our secondary research

101 questions were (1) “What measurement tools are commonly used to evaluate business
102 outcomes?” (2) “Does measurement of business outcomes differ by strategy, study
103 characteristics, or food retail setting?” (3) “Within studies reporting on business outcomes,
104 what exploratory associations are reported between healthy food retail strategies and business
105 outcomes?”

106

107 **Methods**

108 Due to the form of the research questions, multidisciplinary nature of the research area and
109 probable methodological heterogeneity of results, we considered a systematic scoping review
110 to be the appropriate method. We followed the methodology and reporting guidelines by the
111 Joanna Briggs Institute ³⁴. The researchers prepared and agreed upon objectives, inclusion
112 criteria and methods for this scoping review in advance, which were documented in a protocol
113 and registered with PROSPERO (ID CRD42017070263). All researchers agreed upon iterative
114 changes to methodology. We present the final review strategy below.

115

116 **Search strategy**

117 In **Table 1** we outline a typology which includes the *a priori* and emergent business outcomes
118 of interest in this review, as well as detailing data collection methods for each measure (further
119 described under **Results**). Based on the results of preliminary searches in Medline via OVID
120 and EMBASE, input from our multidisciplinary team, key papers on mapping the retail space
121 ^{9,27,35}, reviews of retail social outcomes ^{36,37}, and key retail and implementation theory papers
122 ^{16,17,24,25,38,39}, a full search strategy was developed. Relevant electronic databases of peer-
123 reviewed literature were searched from a range of disciplines: Medline via OVID, EMBASE,
124 Scopus, Business Source Complete, Academic Source Complete, EconLit, PsycInfo, and

125 Cochrane Database of Systematic Reviews. Grey literature was sourced from Open Grey,
126 Google Scholar (first 15 pages only), plus websites and reports from relevant organizations,
127 including the Economic Research Service (ERS) of the United States Department of
128 Agriculture (USDA), the Australian Government, Australian not-for-profit organisations, the
129 USA Department of Health, United Kingdom (UK) Government, the New Zealand
130 Government and the Canadian Government. Theses were sourced from Trove, Proquest
131 dissertations, and Ethos databases. Searches were restricted to English publications involving
132 humans from 1997 to the date of the search in July 2017 in order to capture more contemporary
133 retail practices and research methods. **Appendix II** lists searched databases and corresponding
134 search strategies, including subject headings. A librarian was consulted regarding the final
135 search strategy.

136 The reference lists of all initially included studies and relevant retrieved review articles were
137 used to capture any citations missed by electronic searches (backwards search). Citation
138 searches of included papers were performed using the Science Citation Index and Social
139 Science Citation Index (forward search).

140

141 **Study selection**

142 After the removal of duplicates in Endnote X8, titles and abstracts were initially screened by
143 one researcher, using Rayyan data management software⁴⁰. If multiple articles examined the
144 same initiative and outcomes, only the most recent article was included. A second researcher
145 screened the title and abstract of all included studies and any additional studies where the first
146 researcher was unsure of initial screening classification. Full text articles were reviewed
147 independently against eligibility criteria (**Table 2**) by two researchers. Discrepancies were
148 screened by a third researcher and resolved with discussion. Eligibility criteria were reviewed

149 periodically within the research team at each stage of the review process⁴¹. We included studies
150 which evaluated interventions to improve the healthiness of the real-world in-store food and
151 beverage environment. This included interventions based around one or more components of
152 the traditional marketing mix (4Ps) or any other strategies that altered the environment, such
153 as choice architecture or ‘nudge’ strategies^{42,43}. Studies in the school setting were excluded
154 from the analysis as initiatives are exclusively targeted at children, often do not involve
155 exchange of money for food, and food retail may be heavily influenced by external policies
156 (e.g. procurement requirements), unlike other food retail settings. They will be the subject of a
157 subsequent planned review.

158

159 **Data collection**

160 Data was extracted independently by two researchers and charted using a pro-forma matrix
161 table of study characteristics into Microsoft Excel, which was piloted first. Inconsistencies
162 were resolved by discussion with a third reviewer. Originally, we intended to extract
163 information on the influence of structural, process or contextual factors on business outcomes.
164 However, due to the large number of included studies, we instead focused on increasing the
165 richness of data on business outcomes by exploring the effect of the healthy retail strategies on
166 the favourability of business outcomes.

167

168 **Quality appraisal**

169 While quality appraisal is not generally part of scoping reviews³⁴, we considered mapping the
170 current strength of the evidence to be an important contribution in this emerging research space.
171 Quality appraisal of all included articles was independently conducted by two researchers using
172 the Mixed Method Appraisal Tool (MMAT)⁴⁴⁻⁴⁶ to allow concomitant assessments of

173 qualitative, quantitative, and mixed methods studies. Quality appraisal was based on
174 underlying study design of the paper. Qualitative process evaluations of RCTs were evaluated
175 as qualitative studies⁴⁷. The number of “Yes” answers were divided by the number of
176 applicable criteria to derive a percentage score. Note that when overall scores for qualitative or
177 quantitative studies were 1/3 or 2/3, overall score were rounded up to 50% and 75%,
178 respectively, in order to align with scoring for mixed methods studies within the MMAT.

179

180 **Data synthesis**

181 Synthesis included simple vote counting of the number of studies addressing different business
182 outcomes. Thematic analysis was used to describe the main business outcomes under *a priori*
183 headings of commercial viability, retailer perspectives, customer perspectives, and community
184 outcomes, with openness to new themes arising from the data. Terminology for the themes
185 (**Table 1**) was updated after completion of the review to reflect terminology in included studies.

186 We used NVivo data management software⁴⁸ to conduct a cluster analysis to identify which
187 business outcomes were most often reported together. We also made exploratory summaries of
188 the impact of healthy food retail strategies on business outcomes, reported by strategy type
189 according to the four Ps of merchandising (product, price, place, and promotion)⁸, or reported
190 as a “combined” strategy where more than one of the 4Ps was used at once. We made expert
191 judgments to suggest whether effects were likely to be considered favourable, unfavourable or
192 neutral by retailers (e.g. profit increase corresponded to a favourable outcome) (see **Appendix**
193 **III** for full list of definitions for favourable, unfavourable, and neutral outcomes per measure).
194 Where multiple measures were used for the same business outcome and showed conflicting
195 direction of effects, we reported outcomes as “mixed”. We summarised favourability of
196 outcomes for ‘food service outlets’ (including quick-service restaurants, full-service

197 restaurants, cafés, cafeteria, kiosks, food trucks, and canteens) and ‘grocery stores’ (including
198 supermarkets, grocery stores, butchers, pharmacies, convenience stores/ corner stores, and
199 vending machines) separately.

200 **Results**

201 Our database searching identified 9,711 relevant documents, and additional forwards and
202 backwards citations searching, screening of reference lists of relevant reviews, and grey
203 literature searching identified 2,809 documents. 11,682 unique titles were screened, and 488
204 full-texts were assessed for eligibility after excluding 11,194 records based on title and abstract.
205 A further 381 were excluded after full text screening. Finally, 107 papers were included in the
206 review, encompassing 107 unique studies (**Figure 1**).

207

208 **Description of included studies**

209 For full data extraction summaries of included studies see **Appendix IV Tables S5 to 8**. Note
210 that for counts below, studies that included multiple settings or strategies are included under
211 each relevant category.

212 The context for studies varied greatly, with 15 Organization for Economic Co-operation and
213 Development (OECD) countries represented. The majority of studies were conducted in the
214 USA (n=56)^{18,49-103} or Canada (n=13)¹⁰⁴⁻¹¹⁶. Studies encompassed food service (n=44),
215 grocery (n=56) and mixed (n=7) retail settings including cafeterias (n=24)<sup>18,53,58,59,61,72,78-
216 80,84,85,88,92,97,98,104,115,117-124</sup>, full service restaurants (n=18)^{51,53,54,57,63,64,73,81,82,96,106,123,125-129},
217 corner stores and/or grocery stores (n=19)^{23,49,50,55,56,62,68,73,77,89,90,95,99,100,103,130-134},
218 supermarkets (n=16)^{35,63,71,83,101,130,135-144}, vending machines (n=13)^{52,65-67,74,91,108-111,113,145-147},
219 quick-service restaurants (n=13)^{57,69,70,73,76,86,87,93-95,106,148,149}, and cafés (n=5)^{54,73,125,131,150}.
220 Approximately half of these retailers were considered to have a mandate that integrated health

221 including universities (n=15)^{52,59,61,67,74,82,115,117,118,121,124,147,149,150}, healthcare settings
222 (n=18)^{18,58,70,78-80,84,85,88,92,97,98,104,107,113,119,120,123,145,146,151}, workplaces
223 (n=11)^{53,65,80,85,91,97,98,119,120,122,123,152}, and sports and recreation centres (n=7)^{109-112,114,116,153}.

224 Six initiatives were retailer-led^{57,93,101,107,130,148}, 29 were the result of partnerships^{35,49,54,62-}
225 ^{64,66,74-77,83,84,90,97,105,106,108,127,129,131-133,135,137,141-143,154}, and 41 were researcher-led, with the
226 remainder government-, industry- or health organisation-led. More than half of the included
227 studies (n=66) identified one or more business outcomes in the primary aim of the study. Fifty-
228 three studies were associated with a specific government or industry policy, e.g. the Victorian
229 government “Healthy Choices” guidelines¹⁵⁵.

230 Evaluation frameworks or theories were rarely described (n=15)^{56,69,73,83,91,96,97,109-}
231 ^{111,113,119,129,135,143}. The most frequently described theories were the socioecological model
232 (n=2)^{56,135}, participatory research approach (n=3)^{69,73,143}, the RE-AIM framework³⁹ (n=2)^{73,139},
233 and Greenhalgh’s adaptation¹⁵⁶ of Roger’s diffusion of innovations theory¹⁷ (n=3)¹⁰⁹⁻¹¹¹.

234 Healthy food retail strategies commonly involved changes to a combination of multiple aspects
235 of the consumer nutrition environment (n=60). The most common strategy types were
236 promotion (n=80), including menu labelling and point-of-purchase posters promoting healthy
237 alternatives. Fifty-one studies included changes to ‘product’, including product reformulation
238 in food service and changes to packaged or non-packaged product availability. Thirty-three
239 studies altered price, and 19 altered placement, such as removing confectionery from
240 supermarket checkouts. Eight studies included additional strategies not in the traditional 4Ps
241 marketing mix, for example renovations to stores including new refrigerators to incentivise
242 retailers and improve display ambience^{23,49,77,90,134}. Fifty-six percent of study sub-group
243 treatments focused on increasing purchases of healthy “core” foods¹⁵⁷ or beverages (e.g.
244 reducing the price of bottled water) (n=85 study subgroups), 16% discouraged consumption of

245 unhealthy “discretionary” foods and beverages (e.g. calorie labelling) (n=24), and 28%
246 encouraged substitution from discretionary to core foods (e.g. traffic light labelling) (n=42).
247 Study designs varied. Seventy-seven studies were exclusively quantitative, five exclusively
248 qualitative, and 27 mixed method studies. All exclusively qualitative studies were post-
249 intervention only. Nineteen studies were RCTs, 31 were pre-post without control, 27 pre-post
250 with control and 10 post-only without control.

251

252 **Quality appraisal**

253 The methodological quality score of included papers ranged from 25% (5% of papers), 50%
254 (29%), 75% (41%) and 100% (23%). See **Appendix IV Table S8** for quality scores for
255 individual studies.

256

257 **Frequency and heterogeneity in reporting and measurement of business outcomes**

258 Below we summarise the frequencies of business outcomes reported to date under *a priori*
259 identified headings. Note that the frequencies of outcomes are summed across all studies, and
260 therefore the total number of outcomes reported is greater than the total number of studies.
261 Very few studies used explicitly validated or pre-tested tools for one or all tested business
262 outcomes (detail in **Appendix IV Table S10**). Reported business outcome domains across
263 studies are summarised in **Figure 2** with frequencies per outcome measure per strategy type
264 reported in **Appendix IV Table S11**. Frequently used or validated tools for each outcome
265 category are described below.

266 Commercial viability

267 Eighty-five studies reported on commercial viability outcomes. The most frequently reported
268 of all outcomes was total sales (n=36)^{18,35,52,55,57-59,64,66,67,72,74,78,80,81,86-}
269 88,93,100,110,112,114,116,117,120,125,131,136,138,140,145,147,148,150, followed by revenue (n=25)
270 18,35,51,52,58,59,70,74,75,79,87,88,93,94,98,108,110,112,116,132,138,144-146,153. These were largely determined
271 through objective sales data, using electronic sales
272 systems^{51,52,58,59,64,70,72,75,78,79,81,83,84,86,88,93,98,100,103,115-117,120,121,125,136,144,148-150}. Three recent
273 studies used individualised data from customer loyalty cards^{118,135,138}. Time and/or cost
274 associated with implementation and maintenance (n=20)
275 23,53,60,62,63,69,80,95,97,99,108,109,111,116,119,123,128,135 was measured
276 qualitatively^{23,53,63,69,99,108,109,111,119,123,128}, using monetary costs^{60,62,80,95,116,135}, or through
277 quantitative surveys⁹⁷. An emergent outcome of ‘wastage’ (n=5)^{53,63,68,131} was measured
278 qualitatively^{63,131}, by number of fresh fruit and vegetable items discarded in a grocery setting⁶⁸,
279 or by weighed plate waste in restaurant settings⁵³. Wastage measurement was considered
280 valuable because of the economic loss it represents^{53,68}, and relation to wider social and
281 environmental impacts⁵³, as well as its own inherent value^{63,131}.

282 Retailer perceptions

283 Retailer perceptions were reported in 20 studies^{23,56,60,62,63,68,69,73,75,76,89,95,106,122,123,129-131,141,146}.
284 The most frequently reported retailer perception measures were community stewardship
285 (n=13)^{23,50,62,69,89,95,106,122,123,129,131,141,146}, and retailer level of satisfaction with strategy
286 (n=10)^{50,56,63,68,73,75,76,106,130,131}. Some studies additionally described community stewardship as
287 a reinforcing motivator for strategy maintenance as well an outcome^{106,129,146}. No emergent
288 outcomes were found.

289 Next we describe two validated instruments for retailer perception measures. Seo et al.¹²⁹
290 evaluated a menu reformulation strategy in a full-service restaurant using a quantitative self-
291 administered retailer questionnaire. It included items based on restaurateur attitude towards

292 strategy, subjective norms, perceived behavioural control, and perceived innovation
293 characteristics. The authors conducted preliminary validity and reliability testing (**Appendix**
294 **IV Table S10**). Gittelsohn et al. also used a quantitative measure of retailer perspectives, the
295 “Store Impact Questionnaire”^{56,71}. This was a pre-tested, standardised instrument with
296 questions relating to several retailer psychosocial outcomes including “outcome expectations
297 for sales” and “outcome expectations for overall programme impact”.

298 Qualitative studies reporting on retailer perceptions often used semi-structured or in-depth
299 interviews to generally explore barriers and enablers to the initiative^{23,60,95,97,130}. Other
300 studies^{50,68,75,123,146} described *a priori* questions that specifically addressed different business
301 outcomes, including retailer perceptions.

302 Customer perspectives

303 Customer perceptions were reported in 50 studies. The most frequently reported outcomes were
304 customer level of satisfaction with the healthy food retail strategy (n=34)
305 ^{23,53,54,60,63,69,75,76,80,85,91,92,95,97,98,100,104,105,109,120,121,123,124,127,130,133,134,137,139,141,143,149,151,154} and
306 customer store satisfaction (n=14) ^{53,61,73,77,82,92,106,113,119,122,126,127,133,134,143,145,154}, which were
307 frequently measured within the same study (see **Figure 3**). Customer perspectives were almost
308 exclusively measured using customer surveys<sup>53,54,61,75-77,80,82,90-92,98-100,104-
309 106,113,120,121,123,124,126,127,133,134,137,139,141,143,145,149,154</sup>. Satisfaction measures either explicitly rated
310 the strategy itself^{54,75,76,80,98,100,121,123,124,134,137,139,141,143,149,154}, elements of the store relevant to
311 the strategy^{53,54,77,82,91,92,105,106,113,120,126,127,133,134,145,154}, or the store overall^{53,127,133,134}. Only one
312 study stated it had used a validated tool to measure customer satisfaction; Stastny et al.⁸² used
313 a self-administered customer survey developed by ‘The National Society of Healthcare Food
314 Service Managers’ (HFM) in a foodservice setting. Detail on validation was not provided and
315 the cited weblink no longer works. Lessa et al.¹²⁶ also measured customer store satisfaction

316 using a survey developed by an industry association, the Spanish Institute for Quality Tourism.
317 This survey is written in Spanish and does not appear to be available in English.

318 An emergent relevant business outcome was spend per transaction ^{49,88,90,94,102,103,112,118,134,142}.
319 This was alternatively framed as a commercial viability outcome by some studies ^{90,102}, or as a
320 customer perspective outcome¹⁰³, with the relevant goal for customers to maintain or reduce
321 spend per transaction while improving healthiness of purchases. For consistency in
322 enumeration, we have classified all spend per transaction outcomes as commercial viability
323 outcomes.

324 Community outcomes

325 Only one included study ¹⁰⁷, explicitly explored community outcomes, in this case a ‘societal
326 shift towards healthier food’. This retailer-led strategy involved the removal of carbonated
327 sugar-sweetened and artificially-sweetened soft drinks from sale in a pharmacy in a remote
328 town with only two other food retail outlets. Thus, by collecting the sales data from these three
329 food retail outlets, the researchers were able to determine the overall community shift towards
330 healthier beverage purchases.

331 Clustering of business outcomes

332 A cluster analysis of business outcomes revealed that outcomes within each *a priori* identified
333 theme were mostly likely to be collected in the same studies (**Figure 3**). The fewer ‘links’
334 between outcomes, the more frequently they were reported together. In particular, revenue and
335 total sales were closely related, as were feedback from community and external organisations
336 and retail staff personal satisfaction level. Some clustering is likely to be due to the use of the
337 same data collection tools (e.g. total sales and revenue, and customer store satisfaction and
338 customer level of satisfaction with strategy). In other cases, the outcomes may be linked
339 conceptually (e.g. feedback from community and external organisations and retail staff

340 personal satisfaction level) or causally in a way that is beyond the scope of this review (e.g.
341 community stewardship and time and/or cost associated with implementation and
342 maintenance).

343

344 **Effect of strategies on business outcomes**

345 **Figure 2** includes the exploratory summary of favourability of business outcomes by strategy
346 type (detail in **Appendix IV S11**). We examined favourability findings for food service outlets
347 and grocery stores separately, however we found that results were similar. Therefore we report
348 overall findings here for simplicity, and include stratified results in **Appendix IV Tables S12**
349 **and S13**.

350 There was variability in reporting direction of effect of outcomes (n=322 outcomes reported
351 for n=150 strategy subgroups) (overall 45% outcomes favourable, 15% unfavourable, 34%
352 neutral). Five percent of outcomes were ‘mixed’ meaning that multiple measures of the same
353 outcome suggested different directions of effect. Favourable outcomes were reported for 85%
354 retailer perception outcomes, 65% customer perception outcomes (12% unfavourable, 16%
355 neutral) and 31% commercial viability outcomes (18% unfavourable, 45% neutral). Favourable
356 outcomes were reported for 58% product only strategy outcomes, 32% promotion only strategy
357 outcomes (15% unfavourable, 47% neutral), and 24% price only strategy outcomes (10%
358 unfavourable outcomes, 67% neutral).

359 Overall, the favourability of 1% of study outcomes could not be reported, where there was no
360 comparison group and authors did not indicate whether a result was considered favourable or
361 unfavourable (e.g. absolute time and/or cost associated with implementation and maintenance).
362 Some studies included favourable outcomes in some outcome categories and unfavourable or

363 neutral outcomes in others, for example favourable community stewardship and unfavourable
364 profitability outcomes.

365

366 **Discussion**

367 **Summary and relevance of main findings**

368 One hundred and seven studies were identified describing business outcomes of healthy food
369 retail strategies. Examination of business outcomes to date has been largely limited to objective
370 commercial viability outcomes and customer perspectives. There has been limited exploration
371 of retailer perspectives or community outcomes. In all strategy types, total sales, revenue, and
372 customer level of satisfaction with strategy were among the most frequent measurement
373 outcomes.

374 As the rationale for collecting these business outcomes was often not specified *a priori*, it is
375 difficult to conclude whether the outcomes were (i) perceived as most important in indirectly
376 influencing health outcomes¹⁰⁴; (ii) considered relevant in their own right; and/ or (iii)
377 considered easy to collect (e.g. total sales). Retailers were acknowledged to be key
378 implementation decision-makers in many studies that did include retailer perspectives^{50,123,130}.
379 These studies demonstrated that retailers considered a variety of factors in evaluating the
380 success of a strategy, including community stewardship. Seo et al.¹²⁹ found that the strongest
381 predictor of restaurateur intention to sustain healthy restaurant strategy was “perceived
382 behavioural control” (i.e. having control over the strategy, sufficient technical resources,
383 employee support). The variable was a stronger predictor than subjective norms, relative
384 advantage for restaurant, community stewardship, and retailer support of strategy.

385 Only one included study reported on community outcomes¹⁰⁷. This may be due to several
386 factors including low perceived importance of these outcomes by researchers, difficulty in

387 obtaining data, and difficulty in attributing broader changes to a specific retail strategy. While
388 our focus in this review was on retailer-led strategies (or strategies that have the potential to be
389 retailer-led), findings may also be useful for other nutrition strategies which may affect (but
390 not be implemented by) retailers, and for government priority-setting. For example, industry
391 opposition to SSB taxation has included discussions of the potential impact on the economy
392 and employment¹⁵⁸. Further, a holistic assessment of business outcomes including economic
393 analyses, consumer welfare and commercial viability could be incorporated into economic
394 analyses of retail and food policy interventions which currently focus on cost-benefit outcomes
395 from a government healthcare investment focus.

396 There was a large amount of variability in favourability of outcomes across outcome type and
397 strategy type. In the current review, retailer and customer perceptions were generally
398 favourable across all strategy types. Preliminary estimates suggested favourable effects of
399 'product' strategies on commercial viability outcomes in particular, similar to Grech et al.'s
400 systematic review in vending machines²⁶. We found neutral or favourable effects of
401 'promotion' strategies on commercial viability. This finding differs from the review by
402 Gittelsohn et al.²⁸ who found increases in sales of promoted foods in all small store trials that
403 reported sales data. Findings may differ due to the fact that commercial viability measures
404 reported here also incorporate total store sales and therefore account for customer substitution
405 effects. Customer demographics, barriers and enablers may also differ across settings (other
406 than small stores examined in Gittelsohn et al.), affecting the feasibility of strategies and
407 customer response to change. Moreover, mixed favourability across different outcome
408 categories (e.g. customer perspectives and commercial viability) may increase complexity of
409 retailer decision-making, as it requires retailers to explicitly trade-off these outcomes.

410 We found that electronic sales data were commonly used to measure commercial viability
411 outcomes (e.g. revenue, total item sales), but few validated tools were reported for retailer

412 perspective and customer perspective outcomes. Business outcomes were often considered
413 secondary outcomes and sometimes not included in stated aims and objectives by researchers.
414 In contrast, business outcomes could be considered primary outcomes for retailers, store staff,
415 and customers. In general, the selection of business outcomes and measurement tools could be
416 chosen in consultation with the retailer, considering feasibility, and the marginal cost and value
417 of adjusting nutrition data collection methods (e.g. including questions on customer level of
418 satisfaction in a survey focusing on changes in consumption). This may be facilitated by a
419 participatory action research approach⁷³. Consideration of which types of business outcomes
420 are most relevant to different strategies and settings may allow for more tailored data collection
421 in future studies.

422

423 **Strengths and limitations of studies included in the review**

424 The quality of the included studies varied considerably. Thirty-five percent of studies were
425 rated as 50% or lower quality rating, 41% of studies scored 75%, and 23% of studies scored
426 100%. While the MMAT focuses on primary outcome measures, business outcomes were
427 frequently not primary outcome measures. The development of a tailored tool or more guidance
428 on quality appraisal for secondary study outcomes would have aided in more useful appraisal
429 of included studies. We initially intended to contact original authors for further information on
430 studies, but given the focus on the review on reporting of outcomes, we considered doing so
431 unnecessary to answer our research questions.

432 Many organisations recommend multicomponent public health nutrition interventions ¹⁵⁹.
433 However, the heterogeneity in type of healthy food retail strategies, including over half of
434 studies with more than one strategy type, created difficulties in estimating the direction of effect
435 of specific strategy components on business outcomes. Future research could estimate the

436 effect of specific strategy components together, for example combined pricing and promotion
437 strategies. Moreover, very few included studies examined strategies beyond the traditional 4Ps
438 marketing mix. Additional strategies across the traditional marketing mix, nudge and choice
439 architecture ^{42,43} should continue to be investigated as innovative means of encouraging
440 healthier food purchasing, and their impact on business outcomes reported.

441 Approximately one quarter of included studies used a mixed methods design. This was
442 frequently used to collect a range of different study outcomes, including nutrition-related
443 outcomes, in addition to business outcomes. Collection of similar outcomes from multiple
444 sources may also aid in triangulation of results.

445 Very few studies used validated or standardised tools to measure business outcomes;
446 particularly customer and retailer perspectives. This high heterogeneity in customer and retailer
447 outcome measures is likely to make any quantitative meta-analysis of these outcomes very
448 difficult. However, this may be possible for some sales data-based outcomes in popular settings
449 (e.g. grocery stores) and strategies (e.g. strategies to increase fruit and vegetable availability).

450 A number of validated tools exist for evaluating consumer nutrition environment changes
451 ^{12,13,160}. Our review suggests that similar tools should be developed to measure business
452 outcomes, and that the psychometric properties of existing tools should be more rigorously
453 tested and reported in different settings. At a minimum, face validity of tools should be reported
454 and discussed through a theoretical and literature-based approach ^{73,109-111,139}.

455

456 **Methodological strengths and limitations of the review**

457 This review used a systematic scoping review methodology which allowed us to be open to
458 emerging themes and outcomes of interest³⁴. We have summarised a broader range of business
459 outcomes than has previously been collected ²⁶⁻²⁸ from different disciplines to allow the

460 comprehensive mapping of measures used in this growing research field. Although the
461 favourability of business outcomes of healthy food retail strategies was not a primary outcome
462 of our study, our exploratory summary of impact provides an indication of these effects.
463 However, because business outcomes were often not the primary outcome, studies may have
464 been underpowered to detect changes. Second, weighting of evidence by study design and
465 sample size was beyond the scope of this review. Third, we only included studies that reported
466 on business outcomes, and therefore this review cannot report the overall frequency of
467 reporting of business outcomes in healthy food retail evaluations. Studies that do not report
468 business outcomes may be less likely to demonstrate favourable outcomes.

469

470 **Recommendations for future research**

471 Based on our study findings and key criteria from existing nutritional epidemiology reporting
472 guidelines^{12,14,161,162} we formulated recommendations (**Table 3**). These recommendations are
473 intended to supplement existing recommendations, by specifically targeting factors to improve
474 consistency and usefulness of reporting of business outcomes. They should also be used with
475 reference to the business outcomes typology in **Table 1**, which advises on selection of specific
476 outcome measures and tools.

477 As a first step to better understanding the influence of business outcomes within the direct
478 pathway of effect of healthy food retail strategies, this study was an ‘effectiveness’ focused
479 review¹⁶³ (i.e. what outcomes are reported and what is direction of effect). We leave more
480 precise estimates of the magnitude of effect on business outcomes and a focus on the effect of
481 business outcomes on the implementation and sustainability of healthy food retail strategies to
482 future reviews. Furthermore, the interrelationship and influence of contextual and process
483 factors (e.g. store infrastructure) on implementation, business outcomes and health-related

484 outcomes should be investigated. For example, the process evaluation of an RCT of a grocery
485 discounting strategy in remote Australian stores, “SHOP@RIC”, found that effective and
486 ongoing communication with the store managers was important to implementation fidelity¹³⁰.
487 Finally, this review did not include school food provision interventions, and their unique
488 context and importance for childhood nutrition warrants a dedicated review of business
489 outcomes in this setting.

490 This review also revealed the need to develop consistent business outcome terminology. We
491 searched a wide range of terms *a priori* and came across many more during screening and data
492 extraction. We selected terms to identify distinct constructs and align with existing terminology
493 and with the public health and business literature^{9,16,17,24,25,27,36-39}. Foremost, terms used to
494 describe business outcomes in healthy food retail studies should be consistent in order to
495 facilitate future reviews and evidence syntheses, and the ultimate goal of facilitating the
496 selection of different strategy types to optimise different stakeholder outcomes. We also
497 recommend consulting with retailers to ensure that identified business outcomes encompass
498 the most important outcomes for them. This goal may also be assisted by further studies with
499 retailers to determine which outcomes are generally most influential in decision-making (e.g.
500 as per Seo et al.¹²⁹). The relative importance of different outcomes may also differ by retailer
501 governance structure (e.g. chain versus independent retailer) and by motivation for intervention
502 (e.g. government- versus retailer-led). Core business outcomes which could be consistently
503 collected and compared across healthy food retail strategies using validated tools should be
504 identified. The relevance of community outcomes to evaluation should also be further
505 considered in light of potential retailer and government interest in the broader impact of healthy
506 food retail strategies.

507

508 **Conclusions**

509 This systematic scoping review of the reporting of business outcomes of healthy food retail
510 strategies found that examination of business outcomes to date has largely focused on objective
511 commercial viability outcomes and customer perspectives, with limited exploration of retailer
512 perspectives or community outcomes. Based on our findings, we recommend more consistent
513 reporting of business outcomes, the development and use of validated and reliable
514 measurement tools, and consultation with retailers to ensure that identified business outcomes
515 encompass those outcomes perceived as most important. Improved reporting may assist
516 retailers and policy-makers to select feasible and sustainable healthy food retail strategies to
517 promote a healthier food environment to benefit population health, while taking into account
518 the consequences for retailers, customers, and the broader community.

519

520 **Conflict of interest disclosures:** None to declare

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Table 1: Summary of business outcome concepts and measures

Term	Scope	Definitions and examples of measures ^a	Data collection methods ^b
Commercial viability	Total sales	Total number or volume of food and beverage items sold.	Electronic sales data, sales receipt data, customer loyalty cards.
	Revenue	Total income.	
	Profitability	Revenue minus expenditure; or profit margins.	
	Wastage	Plate waste in cafeterias; or discarded products due to expiry in stores. (NB: Emergent outcome)	Weighed plate waste.
	Time and/or cost associated with implementation and maintenance	Upfront and ongoing infrastructure or equipment costs; staffing costs; or cost of changing suppliers.	Contract documents, billing receipts, work plan allocation, wholesale cost of ingredients/stock, staffing costs; Qualitative interviews with retailers.
	Return on investment	Return on investment for retailer, e.g. monetary investment per 100 items sold (does not include ‘health-based’ cost benefits); or cost-benefit analysis.	Return- Electronic sales data; Investment- As above for time/cost measures.
	Competitiveness	Providing point-of-difference compared to other similar retailers.	Qualitative interviews with store managers/ owners.
	Value creation	Whether retailers consider the strategy adds value to their business, e.g. is attractive to customers.	
	Opportunity costs	“Opportunities foregone at the time an asset or resource is used...” (1) e.g. Retailer discussion of other lines or projects that were displaced due to healthy food strategy.	
	Attitudes of business stakeholders	Attitudes of stakeholders including staff, suppliers, industry organisations.	Qualitative interviews with store managers/ owners/ stakeholders.
Store patronage	Foot-traffic; or frequency of customer purchases; or customer loyalty to store; or number of transactions	Electronic sales data; door counters.	
Spend per transaction	Revenue per customer transaction. (NB: Emergent outcome)	Electronic sales data; sales receipts from customer surveys; loyalty card data.	

Retailer perceptions	Retail staff personal satisfaction level	Impact on the retail staff or their friends or family's wellbeing, e.g. improved nutrition knowledge.	Qualitative interviews with store managers/ owners.
	Feedback from community and external organisations	Informal or formal recognition (such as accreditation program or award).	
	Retailer level of satisfaction with strategy	Level of general satisfaction and/or intention to continue with the strategy; Level of satisfaction with other outcomes including customer perceptions and commercial viability.	
	Community stewardship	Perception of business impact on customer health behaviours and outcomes.	
Customer perceptions	Customer level of satisfaction with strategy	Customer feedback relating to the overall strategy, or characteristics of the strategy, e.g. tastiness of new offerings.	Customer surveys (e.g. exit surveys)
	Customer level of satisfaction with store	Level of customer satisfaction with range, healthiness, price etc., or store overall.z	
	Customer demand for healthy items	Demand for new or existing healthy food and beverage items at intervention outlet. A measure other than sales of strategy target foods.	
	Customer demand for healthy food at other retail sites	Sales of target foods at nearby food outlets.	Electronic sales data or receipts, customer surveys
	Consumer welfare	"Individual [consumer] benefits derived from the consumption of goods and services" (1). Often quantified via willingness-to-pay.	
Community outcomes ^c	Community perceptions of strategy or similar	Level of community acceptability of strategy.	N/A
	Broader social impact	Level of retailer or customer reported retailer-customer rapport.	N/A
	Societal shift towards healthier food	Community sales of target foods; number of retailers implementing the strategy.	Electronic sales data, customer surveys
	Level of barriers for other retailers to implement similar policies	Range of healthy food or beverage alternatives offered by local supplier.	N/A

982 N/A, no relevant tools found in scoping review ^a Due to the scoping nature of this review, these were not the only possible ways of measuring

983 these outcomes. Additional outcomes were assessed on a case by case basis. ^b Data collection methods as identified in scoping review.

984 ^c Community outcomes related to the strategy under study, not general community trends.

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Table 2: Final review inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Language	English.	All other languages.
Publication year	January 1997 to July 2017.	Prior to January 1997.
Country	OECD member countries.	Non-OECD member countries.
Retail environment	‘Food and beverage store’, for example, grocery, convenience stores, supermarkets, fresh food markets, bakeries and specialty food stores; ‘Restaurants and Other Eating Places’, including cafeterias and cafes; ‘Vending machine merchandisers, sale of products’ related to food and beverages.*; Customer transaction should either involve the exchange of money or otherwise have the potential to impact commercial viability.	Retail stores in schools; opening of new stores.
Strategy type	Real-world strategies improving the healthiness of the non-alcoholic in-store food and beverage environment. May include merchandising strategies focusing on product (availability and reformulation), price (including price promotions), place, and promotion (including advertising and labelling), or any combination of these.	Strategies targeting the behaviour of individuals or households outside the store environment; external changes that are not retailer-led, e.g. mass media campaign; not able to be feasibly implemented in the real-world; hypothetical strategies.
Healthiness of change	In line with national dietary guidelines: (i) increase purchases of core foods (dairy and alternatives; cereals, meat and alternatives; fruit; vegetables and legumes; unsaturated fats and oils) ¹⁵⁸ ; (ii) reduce purchases of discretionary foods “high in kilojoules, saturated fat, added sugars and/or salt or alcohol” ¹⁵⁸ ; or (iii) substitute a healthier version of a discretionary item (e.g. switching regular to diet soft drink).	Introduction of a new ‘healthier’ discretionary food in the absence of a ‘swap’; specialty diets, e.g. gluten-free or breastmilk substitutes.
Outcomes of interest	Identified outcomes that have the potential to affect the successful implementation and sustainability of healthy food retail strategies including outcomes in Table 1 . Outcomes described at the level of store or chain.	No reporting of outcomes of interest.
Timing of study	Strategy had been implemented at time of study (and may be ongoing).	Formative evaluations; protocols; descriptions of strategies; preliminary or planning studies.
Publication type	Full text of primary research in peer reviewed or grey literature.	Opinion pieces (e.g. commentaries, editorials); conference abstracts.

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OECD, Organization for Economic Co-operation and Development. *Definitions according to the North American Industry Classification System (NAICS)¹⁵⁹. Categories 445, 7225, 4542.

988 **Table 3: Recommendations for design and reporting of business outcomes in healthy food**
 989 **retail strategy evaluations**

Stage of research	Recommendation
Evaluation design	<ul style="list-style-type: none"> • Select business outcomes in consultation with the retailer, considering feasibility, and the marginal cost and value of adjusting nutrition data collection methods. • Ensure that study is powered for key business outcomes.
Data collection	<ul style="list-style-type: none"> • Use relevant and validated tools for business outcome measurement. In the absence of validated tools, select measurement tools that are theoretically based and report to allow replication.
Publishing	<ul style="list-style-type: none"> • Publish null and unfavourable results alongside process evaluations to facilitate researcher and practitioner learning.
Reporting	
Abstract	<ul style="list-style-type: none"> • Include description of measured business outcomes.
Introduction	<ul style="list-style-type: none"> • Provide rationale for inclusion of specific business outcomes.
Aims	<ul style="list-style-type: none"> • Specify business outcomes of interest.
Methods	<ul style="list-style-type: none"> • Describe retail strategy context including whether retailer-led, relevant policy context and retail outlet governance.
Results	<ul style="list-style-type: none"> • Report statistical significance of business outcomes.
Discussion	<ul style="list-style-type: none"> • Reflect on relationship between business outcomes and other measured outcomes. • Consider how context may have influenced business outcomes.

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992 **Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow**

993 **diagram of included studies.** OECD, Organisation for Economic Co-operation and

994 Development

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996 **Figure 2. Summary of business outcome domains used and direction of effect in included**
997 **studies, reported by marketing mix strategy type per study sub-group**

998

999 **Figure 3. Clustering of reporting of business outcomes.** n, number of included study

1000 subgroups reporting each outcome

1001