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## Introduction

Food and access to nutritious and affordable food are essential resources for health. FEs may be defined in terms of physical, economic, and sociocultural access to food in a community or neighbourhood<sup>1</sup>. In Montréal, food environments (FE) are one of the most invested domain of local intersectoral action.

Although multiple systematic reviews have been conducted on FE correlates of health, a clear overview is lacking.

The objective of this umbrella review is to **give a rigorous update of the scientific knowledge** (systematic review of reviews).

## Methods

A modified PRISMA<sup>2</sup> methodology was followed:

- ✓ Protocol (part of a larger project, PROSPERO CRD42016051609) with a priori eligibility criteria to guide inclusion of reviews
- ✓ Search strategy according to the PICO definition:
  - **Population:** general population
  - Phenomenon of **interest:** correlations between characteristics of FE and health
  - **Context:** urban neighborhood of OECD countries
- ✓ 10 databases and grey literature from 2008 to 2016; completed by hand searching of references lists
- ✓ Two steps selection process for the inclusion of reviews and data extraction, made independently by two reviewers
- ✓ Methodological quality assessment with the AMSTAR tool<sup>3</sup>
- ✓ Results summarised across exposures within the community FE (eg, geographic access and availability of food outlets) and consumer FE (eg, availability, variety and price of food options)<sup>4</sup>.

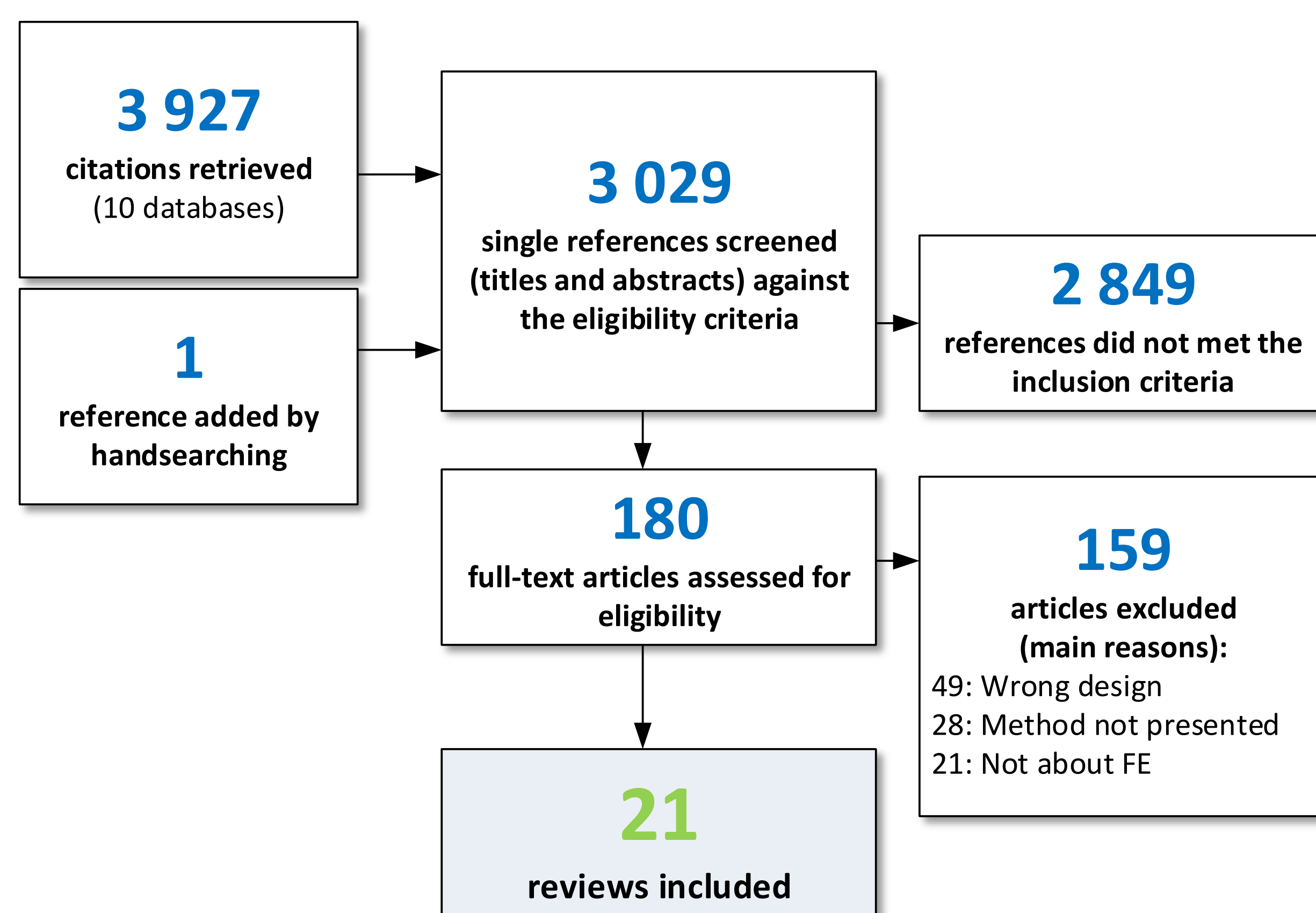


Figure 1. Literature flow diagram

## Results synthesis

Types of results	CONSISTENTLY UNFAVORABLE		UNFAVORABLE TREND		INCONSISTENT		FAVORABLE TREND		CONSISTENTLY FAVORABLE	
	Weight status	Healthy diet	Weight status	Healthy diet	Weight status	Healthy diet	Weight status	Healthy diet	Weight status	Healthy diet
<b>HIGH QUALITY REVIEWS (n = 3) (AMSTAR higher or equal 8)</b>										
FE dimensions	Supermarkets				●◆	◆	★		◆	
	Groceries			★		●◆	◆			
	Convenience stores	◆		●◆			◆			
	Fast-Food			★◆		●				
<b>MODERATE QUALITY REVIEWS (n = 12) (AMSTAR between 4 and 7)</b>										
FE dimensions	Supermarkets				●	●●●◆	◆	◆	★◆◆	★◆◆
	Groceries					◆				
	Convenience stores	●	●★	●◆		●●●	◆			
	Fast-Food	●	◆	★	●	●●◆	●●◆◆			
<b>QUALITY REVIEWS (n = 6) (AMSTAR lower than 4)</b>										
FE dimensions	Supermarkets					●			★◆◆	★
	Groceries									
	Convenience stores						◆	●		
	Fast-Food			★	◆	●◆◆	◆◆			

Figure 2. Summary of evidence for most studied food environment exposures

## Results

Twenty-one reviews were included<sup>5-25</sup>, covering 157 relevant primary studies. These were mostly conducted in US, using cross-sectional design, with few longitudinal studies.

Weight status or dietary behaviors (eg, fruit and vegetable consumption) were the most common health outcome variables studied. Aspects of consumer FEs were less common.

Quality of reviews: 3 of high, 12 of medium and 6 of low quality. Quality was higher for reviews on weight status.

Correlations between FE and body weight and dietary behaviors provide **inconsistent evidence**. Some trends were observed:

- ✓ Better access to supermarkets associated with better weight status; less consistently with diet;
- ✓ Associations for access to grocery stores were mixed;
- ✓ Access to convenience stores associated with worse weight status, especially for children;
- ✓ Access to fast food outlets associated with worse body weight and dietary outcomes.

Other dimensions of the FE for which evidence is inconclusive (not listed in table), although promising: overall measures of the healthfulness of FEs, some dimensions of the consumer FEs and from alternative food networks (eg, farmers markets, urban agriculture).

## Conclusion

Evidence of correlation between food environment and adiposity and dietary behaviors is inconsistent.

Primary study quality was an issue, significant heterogeneity among studies limit what can be learned from this research.

More longitudinal studies and natural experiments are needed to strengthen the evidence, as well as qualitative research for stronger theoretical understanding of how people access food. More considerations should also be given to define and measure food environment exposures and health outcomes.

With regard to local intersectoral action, evaluations and synthetic reviews of equity-oriented approaches to improve non-traditional healthy food retail options into underserved communities should be increased. Examples include: financing programs to incentivize grocery store development, improving availability of farmers' markets and community gardens, and creating new forms of wholesale distribution through food hubs.

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