

# The influence of the food environment on dietary habits and behaviours

## Introductory statement

An introduction to the use of systems modelling to explore how 'vicious cycles' sustain/maintain the unhealthiness of our food environments.

The focus is on acknowledging the various variables in our food environment, their influence on each other, and how the relationships between these variables serve to foster an unhealthy food environment in some parts of Auckland.

## Background

Systems thinking focuses on helping us come to grips with complex problems and models are key devices we use to understand that complexity. Causal Loop Diagrams (CLDs) provide a formal language for developing causal theories about system function and, because of their visual nature, communicating that theory to others in a transparent and understandable way.

A CLD consists of four basic elements. These are; i) the variables, ii) the links between them, iii) a description of the nature of those links, and iv) a description of the behaviour the system will produce

CLDs provide us with a mechanism to describe the key variables in the system and the links between them, bringing them together in a series of feedback loops. By linking a number of these loops together we can create a causal theory about the problem we are faced with.

## Feedback Loops

Feedback loops are used to diagrammatically identify and communicate systems change, and highlight the inter-relationships between variables and how they operate. Reinforcing feedback loops encourage a system to continue in that direction. When the reinforcing loop is undesirable it can be referred to as a vicious cycle.

Below is an example of a reinforcing feedback loop:

<https://www.thwink.org/sustain/glossary/FeedbackLoop.htm>

An example of a reinforcing loop is **Populat on Growth**. As *population* goes up, so does *births per year*. As that goes up, so does future population. The loop goes round and round, growing exponentially until the loop hits its limits, which are not shown.

Feedback loops tell us a story about systems function.

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## Some helpful YouTube videos on systems thinking:

Introduction to Systems Thinking:

<https://www.youtube.com/watch?v=-XfmhTmjAP4&list=WL&index=7&t=15s>

A systems story (Systems thinking)

<https://www.youtube.com/watch?v=rDxOyJxgJeA&list=WL&index=8&t=0s>

Food webs: Feedback loops: How nature gets its rhythms

<https://www.youtube.com/watch?v=inVZol1AkC8>

Systems Thinking and Complexity in Health: A Short Introduction

<https://www.youtube.com/watch?v=HzT1-BZIJQA&list=WL&index=2&t=0s>

Introduction to causal loops:

<https://www.youtube.com/watch?v=tTo06jbSZ4M&list=WL&index=6&t=0s>

Leverage Points:

If needed: Join the revolution: Systems thinking to transform Thailand's health system

<https://www.youtube.com/watch?v=k2EW8xk7GSs&list=WL&index=3&t=0s>

## Learning objective

Understand the function of reinforcing feedback loops within a Causal Loop Diagram.

## Student outcomes

Through an activity students will understand how such 'vicious cycles' (reinforcing feedback loops) cause unhealthy food environments.

## Learning activity: Feedback loops and vicious cycles

Resources:

- Jigsaw Article (put context information on whiteboard in front of class [PowerPoint slide attached]. Article is divided into two parts. Group 1 and Group 2. Each pair numbered as 1 or 2 and gets their relevant copy)
- Student Activity Worksheet (print one copy for each student – either group 1 or group 2)

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What to do:

1. Split students in pairs. Pair them as Group 1 and Group 2
2. Each student reads a section of the article and reflects on the associated questions (identifying variables of influence)
3. Each student then discusses their section of their article and their variables with their partner (end result: each student has a good understanding of the whole article)
4. As a pair – students list the variables discussed in the article that have an impact on fruit and vegetable consumption
5. Based on the information from the article, and the discussion on the key variables, students then complete the worksheet exploring the vicious cycles that create an unhealthy food environment.

## Fruit and vegetable intake declines among kids, calls for better regulation of fast food outlets

Hannah Martin 11:32, Aug 22 2019

STUFF

New Zealand has one of the highest childhood obesity rates in the world but new research has shown it's going down - if only by a small fraction.

Community members identified the high cost of fresh produce, the high volume of fast food promotion and advertising; and fast food outlets in their neighbourhoods, and parents being time-poor as key barriers preventing kids getting enough fruit and vegetables.

Co-author and HFW systems innovator Michele Eickstaedt said the workshops highlighted two barriers out of the community's control – the toll low-income work has on health, and the density of fast food outlets in their neighbourhoods.

Some schools in Auckland also did not have access to the Government's [Fruit in Schools programme](#).

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**According to the article what are some of the main causes (reasons) why fruit and vegetable intake is so low among children in West Auckland?**

List the variables (things, reasons):

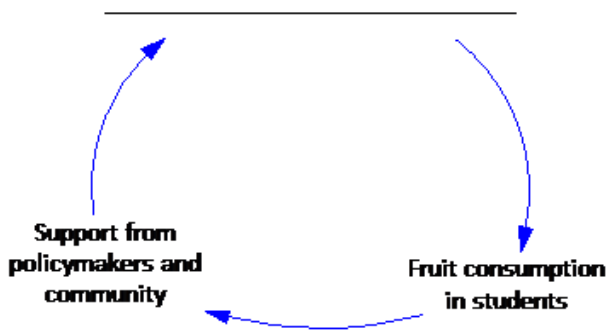
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Once you have listed your variables, link back up with your partner. Each of you take turns to explain your section of the article until both of you have a good understanding of all the variables that have caused the low consumption of fruits and vegetables in West Auckland children.

Next, try and complete the feedback loops below.

Based on the article and variables identified, fill in the blank for each feedback loop. Then write down a possible interpretation for each feedback loop.

These loops tell a story of why fruit and vegetable intake has decreased in West Auckland Children.



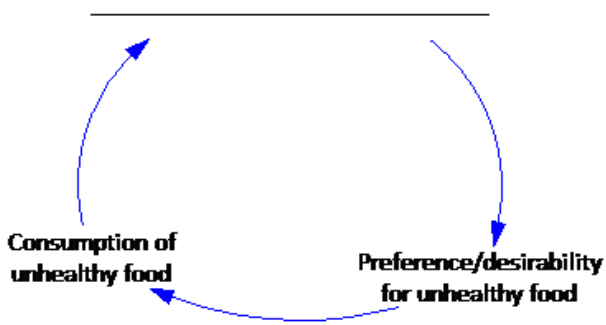
Interpretation of Feedback Loop 1:

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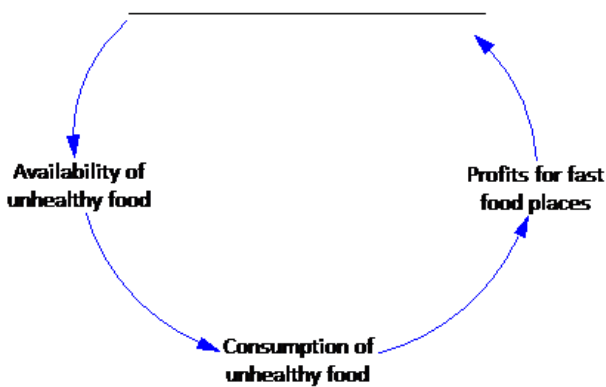
Interpretation of Feedback Loop 2

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Interpretation of Feedback Loop 3:

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## Fruit and vegetable intake declines among kids, calls for better regulation of fast food outlets

Hannah Martin 11:32, Aug 22 2019

STUFF

New Zealand has one of the highest childhood obesity rates in the world but new research has shown it's going down - if only by a small fraction.

Parents were working multiple low-wage jobs, bound by inflexible hours, leaving them little time to cook and leading to a lack of cooking skills at home, she said.

Participants said families with low budgets were also more likely to prioritise being full over eating healthily, she said.

Gerritsen said the number of fast food outlets and advertising in the area had "ramped up dramatically" in the past five years, with services such as UberEats meaning junk food is "literally everywhere".

Food options available in low income communities tend to be "much worse" than those available in the CBD – while there was a "huge selection", all were unhealthy, she said.

Gerritsen backed participants' calls for government regulation of the fast food sector to address advertising standards and outlet density.

"Communities cannot tackle these systemic issues on their own," she said.

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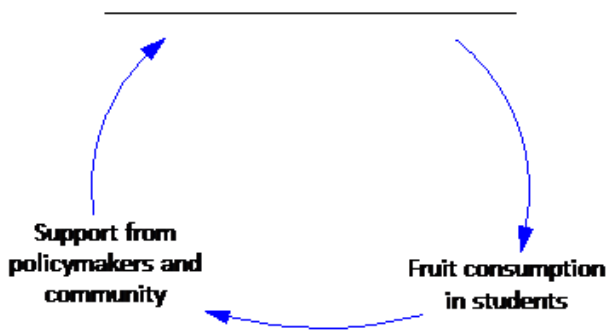
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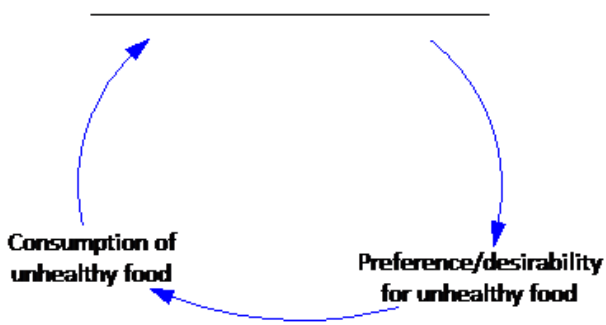
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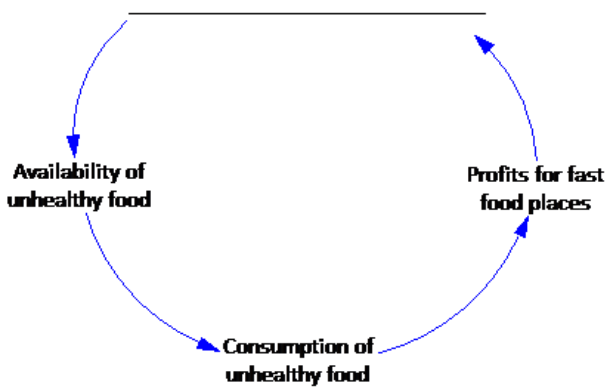
Interpretation of Feedback Loop 2

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Interpretation of Feedback Loop 3:

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