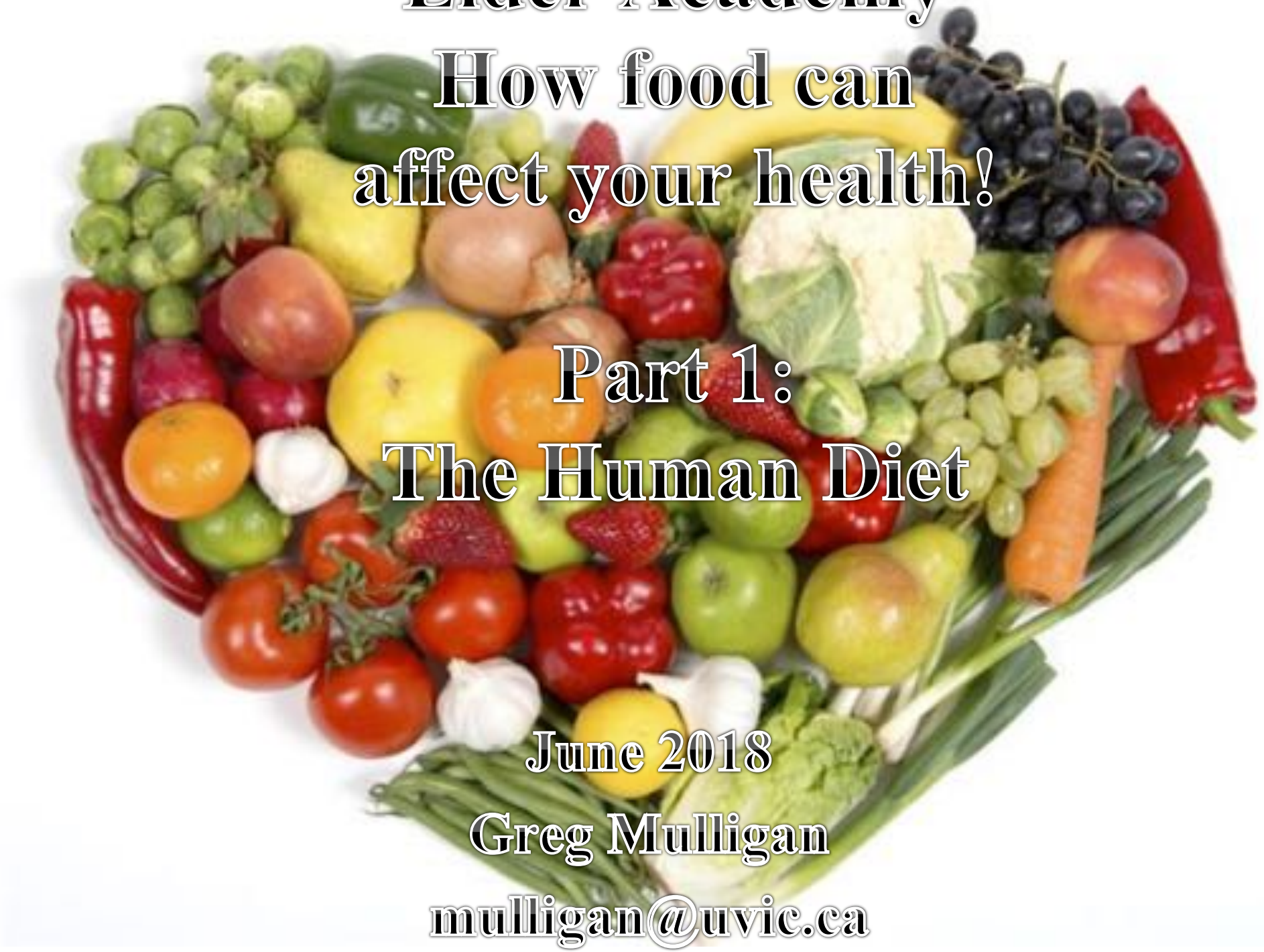
Elder Academy
How food can affect your health!



Part 1:
The Human Diet

June 2018

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Topic of the Day

- History of Human Food
  - Ancient diet
  - Modern diet
    - Processing food
    - Current behaviour
  - Food Contamination
  - Food Additives
  - Food Safety
  - Practical Considerations

What is Nutrition?

Nutrition is the science of food:

- How food *nourishes* our bodies
- How food *influences* our health

Nutrition is a '*new*' science:

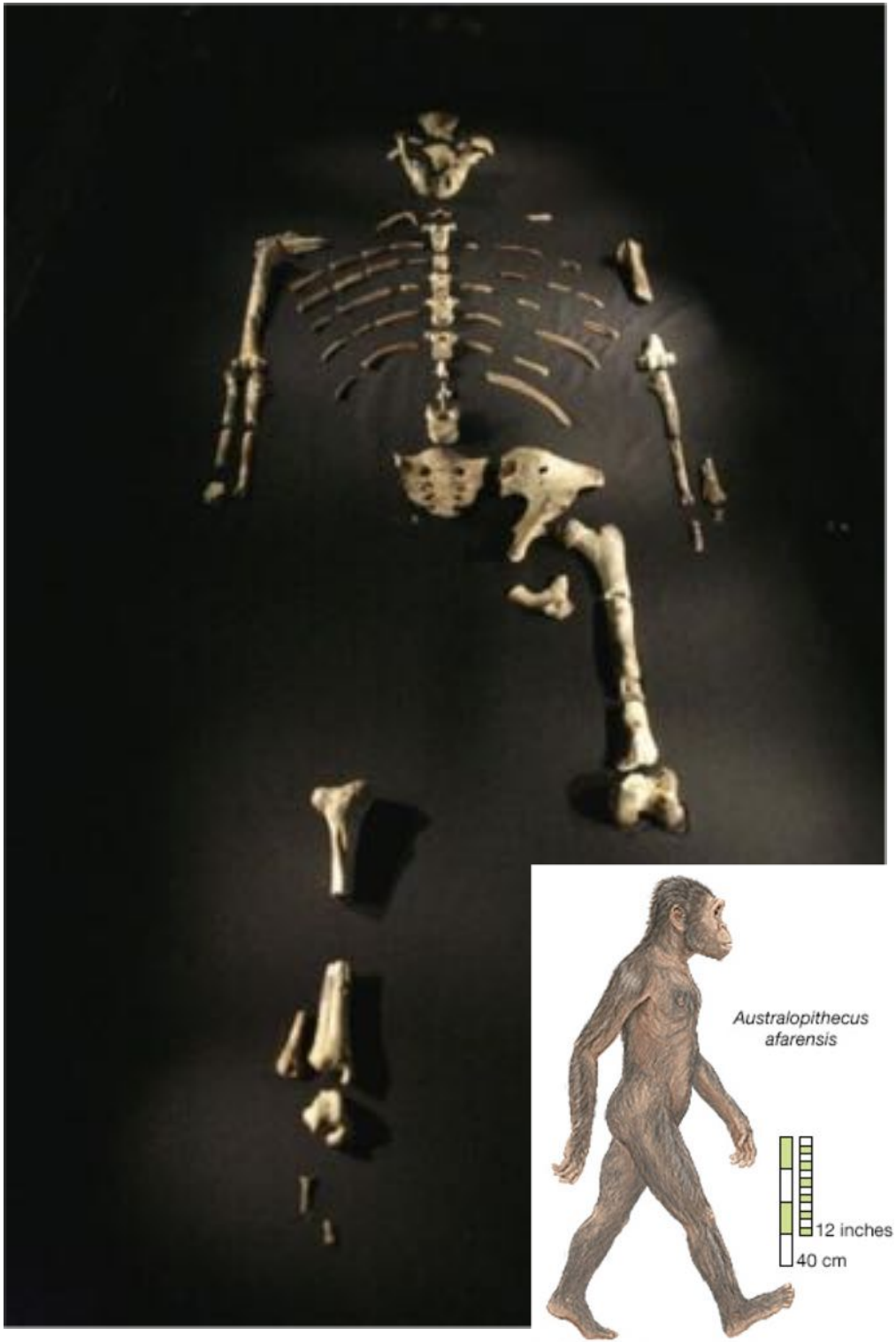
- The *Journal of Nutrition* est. 1928
- In the writings of *Aristotle (384-322 BC)*

For how long have we been eating the foods we know & love?

3.2 million years ago

"Lucy" - Laetoli hominin

Species = Australopithecus, A. afarensis



1.2 million years ago

Oldest direct evidence of diet

Mostly plants & some meat

All raw (some debate)

Triticeae grass & seeds

0.8 million years ago

Oldest evidence of cooking

Smaller mammals & (likely) birds + plants & seeds

3000 to 25000 years ago

Cultivating crops & livestock

Ploughing with a yoke made of horns from horned cattle in Ancient Egypt.
Painting from the burial chamber of Sennedjem, c. 1200 BC (~3200 years ago).

15000 years ago

Fermentation

- Neolithic development – 4000 to 17200 years ago
- Written about since 9000 years ago in Chinese literature

Neolithic era deer antler ploughs from the region that is now western Russia

Food and cooking items retrieved at a European Neolithic site: millstones, charred bread, grains and small apples, a clay cooking pot, and containers made of antlers and wood

~100 years ago

Industrialized food production & "*Fast-food*"

- 1850s-1950s

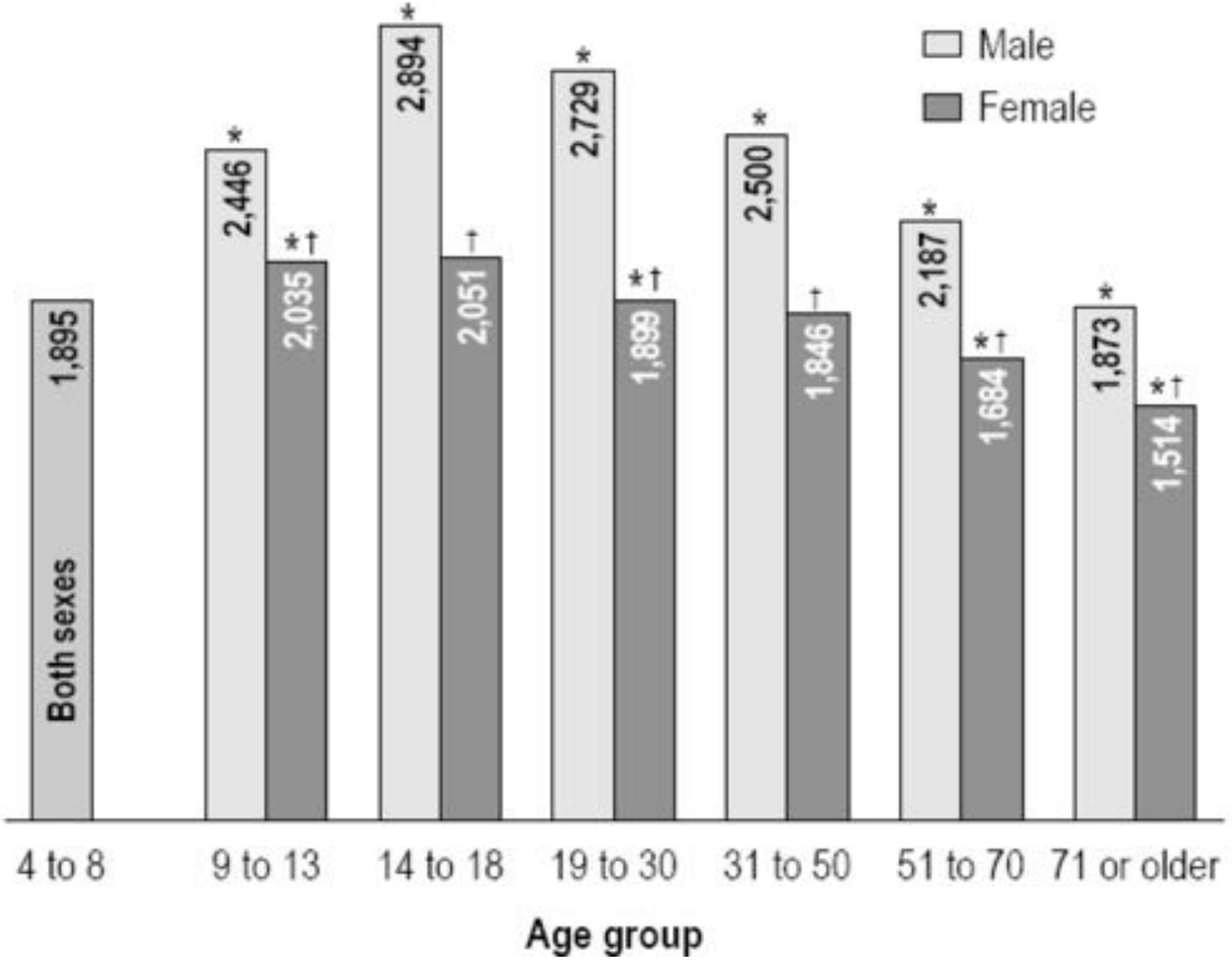
A typical modern grocery store has more than 50000 items

McDonalds was founded in 1940 & in 1948 reorganized with a production line in the kitchen, then franchised in the 1950s

Modern Canadian Diet

How many calories do you need each day?

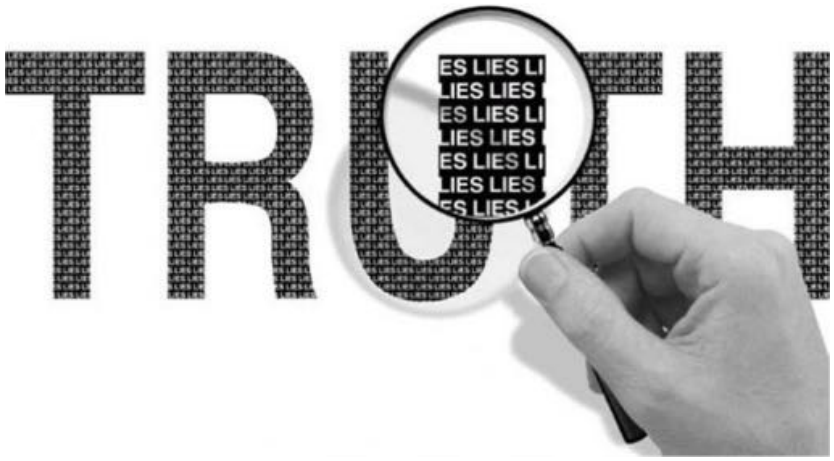
- Numbers are calories consumed per day



Tracking

Most people lie about what they eat!

- Chronic under-reporting
- Social pressures/shame
- Results in under-reporting by:
  - 12-14% for men
  - 16-20% for women

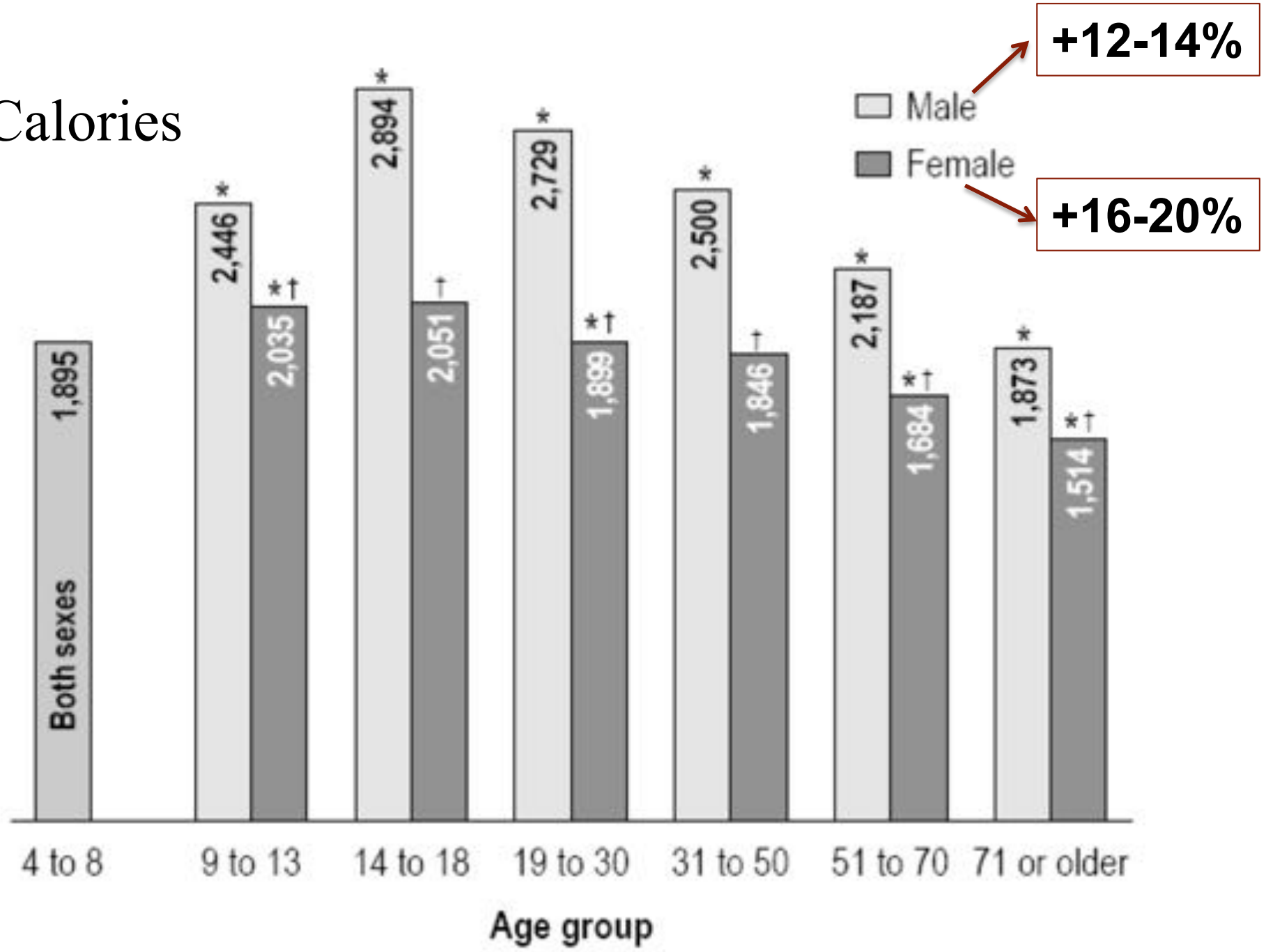


- '*Health*' messages may have increased under-reporting
- '*Away from home*' meals major factor

Archer et al. 2013

Modern Canadian Diet

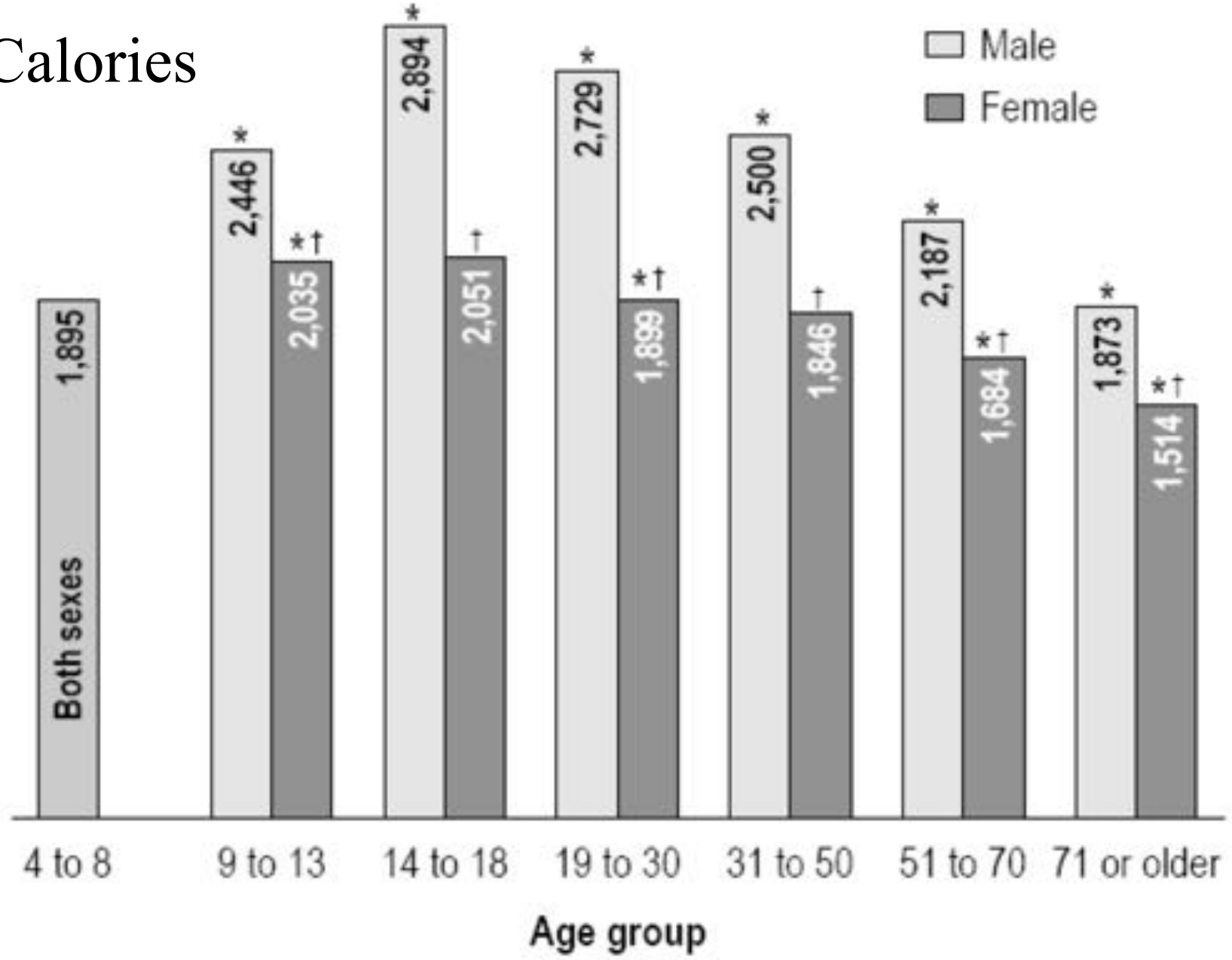
- Calories



Modern Canadian Diet

How many calories do you need each day?

- Calories



Energy Expenditure (EE)

- Basal Metabolic Rate (BMR)
  - Minimal amount of energy needed to maintain **basic physiological functions**
- Resting Metabolic Rate (RMR)
  - Energy required to maintain basic physiological functions (BMR) in a **relaxed, awake, & reclined state**
- Total Daily Energy Expenditure (TDEE)
  - RMR + any physical activity
    - Gardening, house cleaning, exercise, etc.

How many calories do you need each day?

- Highly individual!

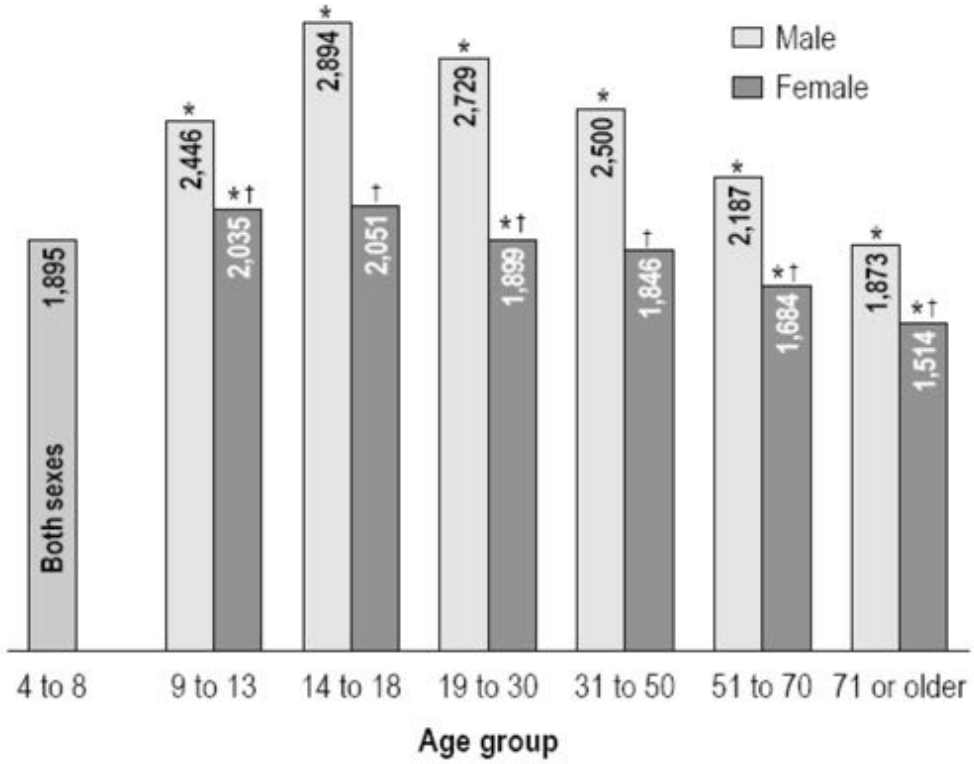
- Can estimate Resting Metabolic Rate (RMR) for:
  - *Females*, multiply body weight in pounds by 10
    - Example: 150 lbs x 10 = 1500 calories per day
  - *Males*, multiply weight in pounds by 11
    - Example: 150 lbs x 11 = 1650 calories per day

Modern Canadian Diet

How many calories do you need each day?

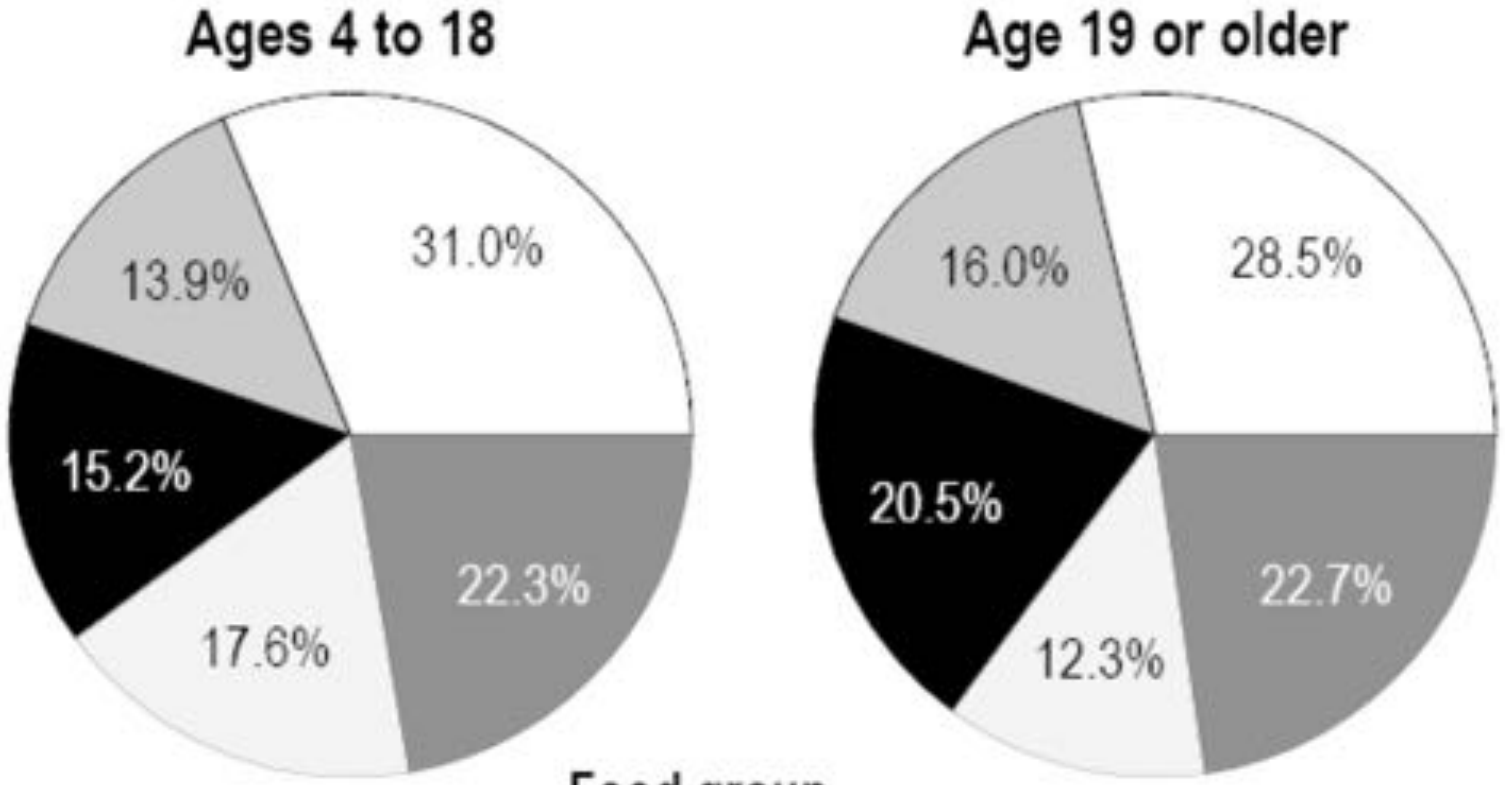
Calories

- Should be:
  - 10-35% protein
  - 20-35% fat
  - 45-65% carbohydrate



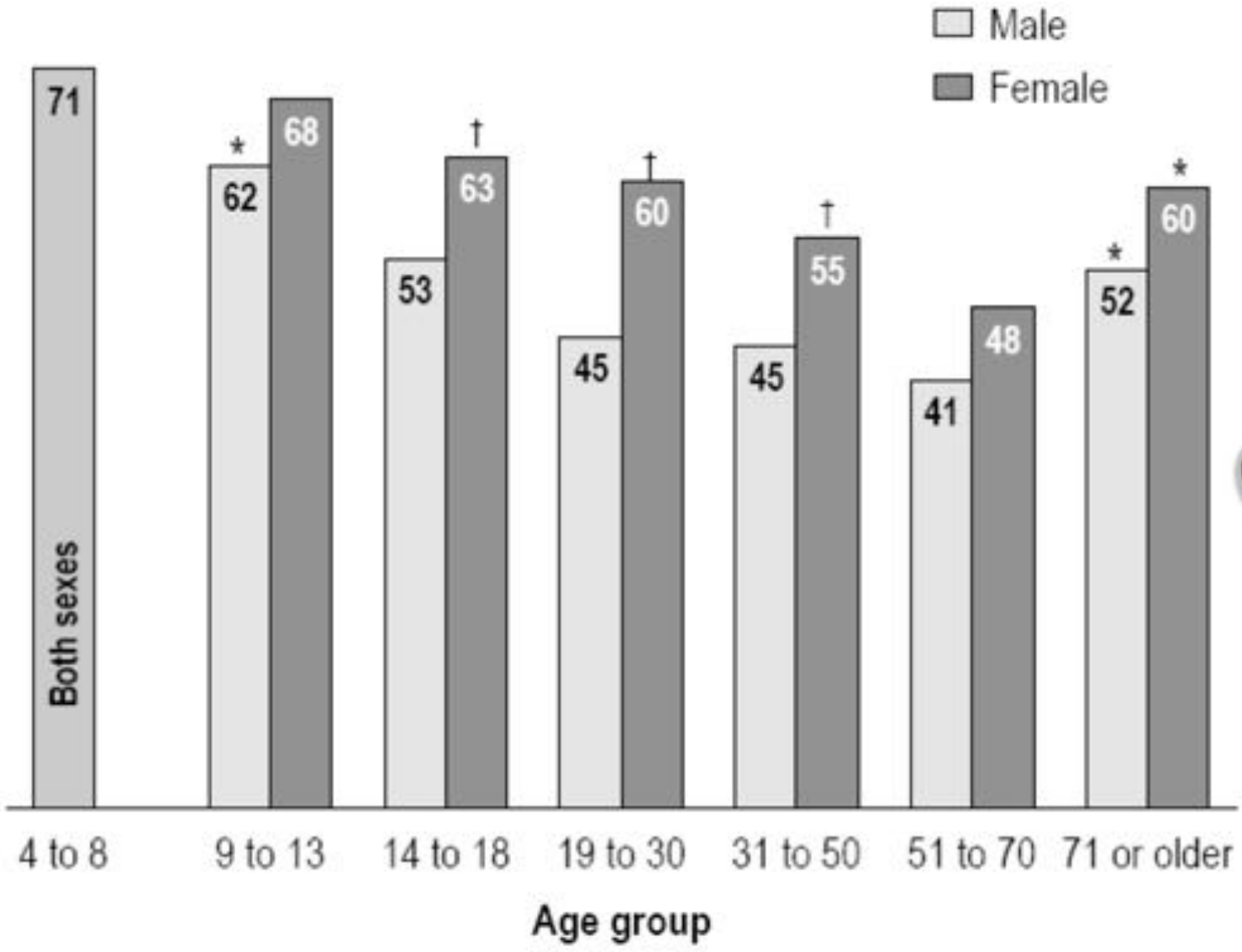
- Where:
  - Protein = 4 calories per gram
  - Fat = 9 calories per gram
  - Carbohydrate = 4 calories per gram
  - Alcohol = 7 calories per gram

Modern Canadian Diet



Modern Canadian Diet

- Fruit and vegetable intake is low
- Numbers are % below recommended servings



Modern Canadian Diet

Meat and Alternatives

Average >200 g per day for *males* 14-70 yr

1 in 4 was over 300 g

136-174 g for *females* 14-70 yr

Younger and older were less

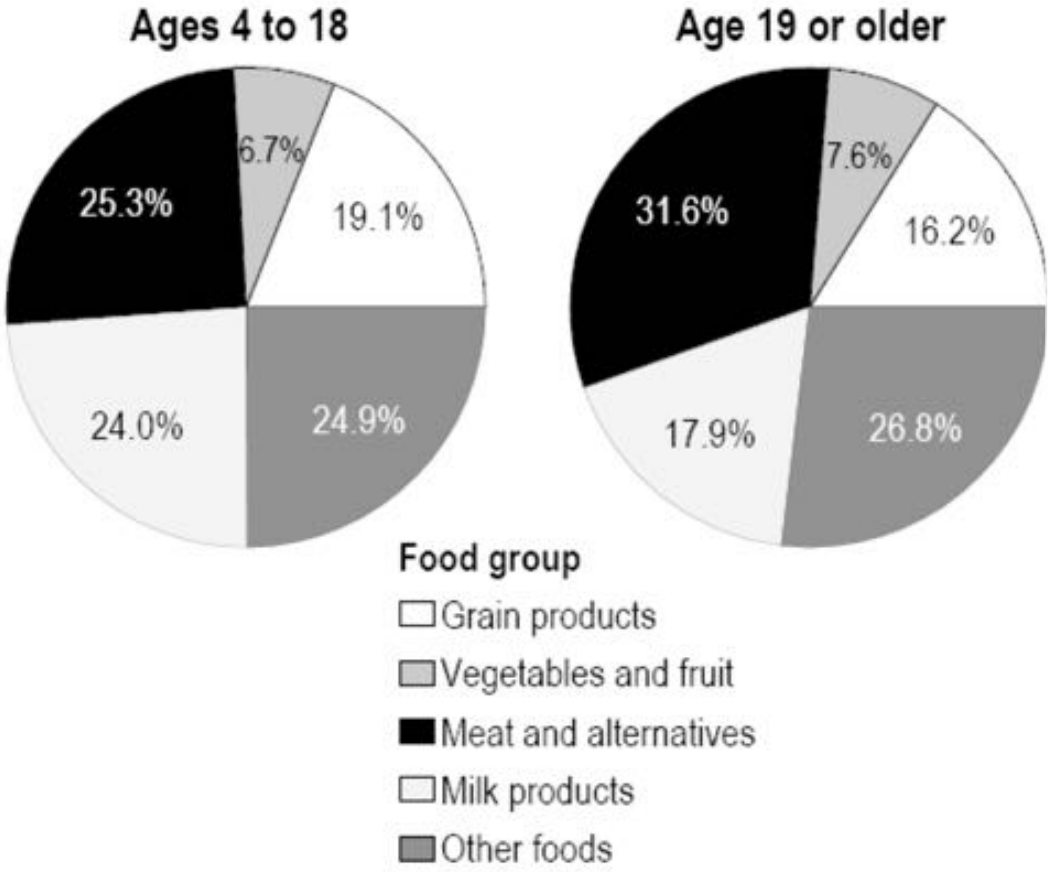
Most modern guidelines are for 1.2 g/kg body weight for older adults:

Example: 150 lbs = 68 kg = 82 g per day

Modern Canadian Diet

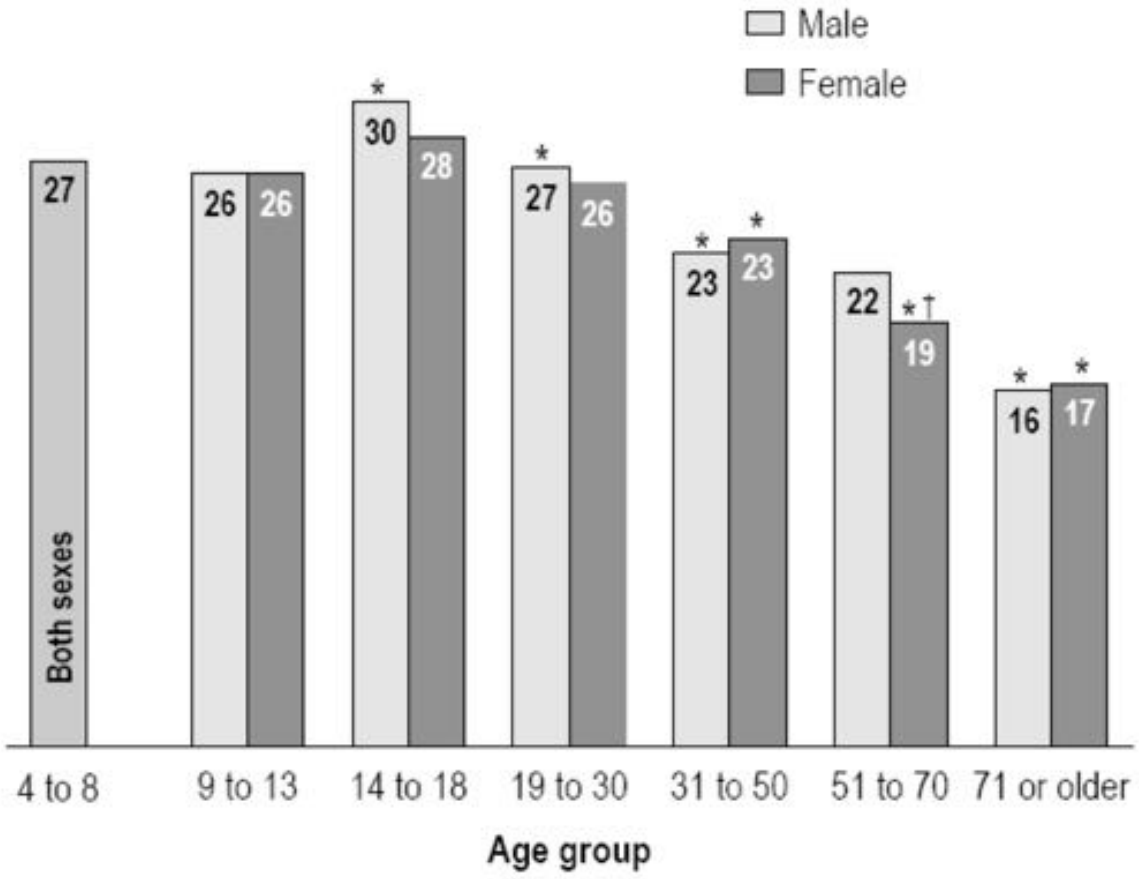
Fats

- Most people exceed recommended intake
- Greatest single source is meat



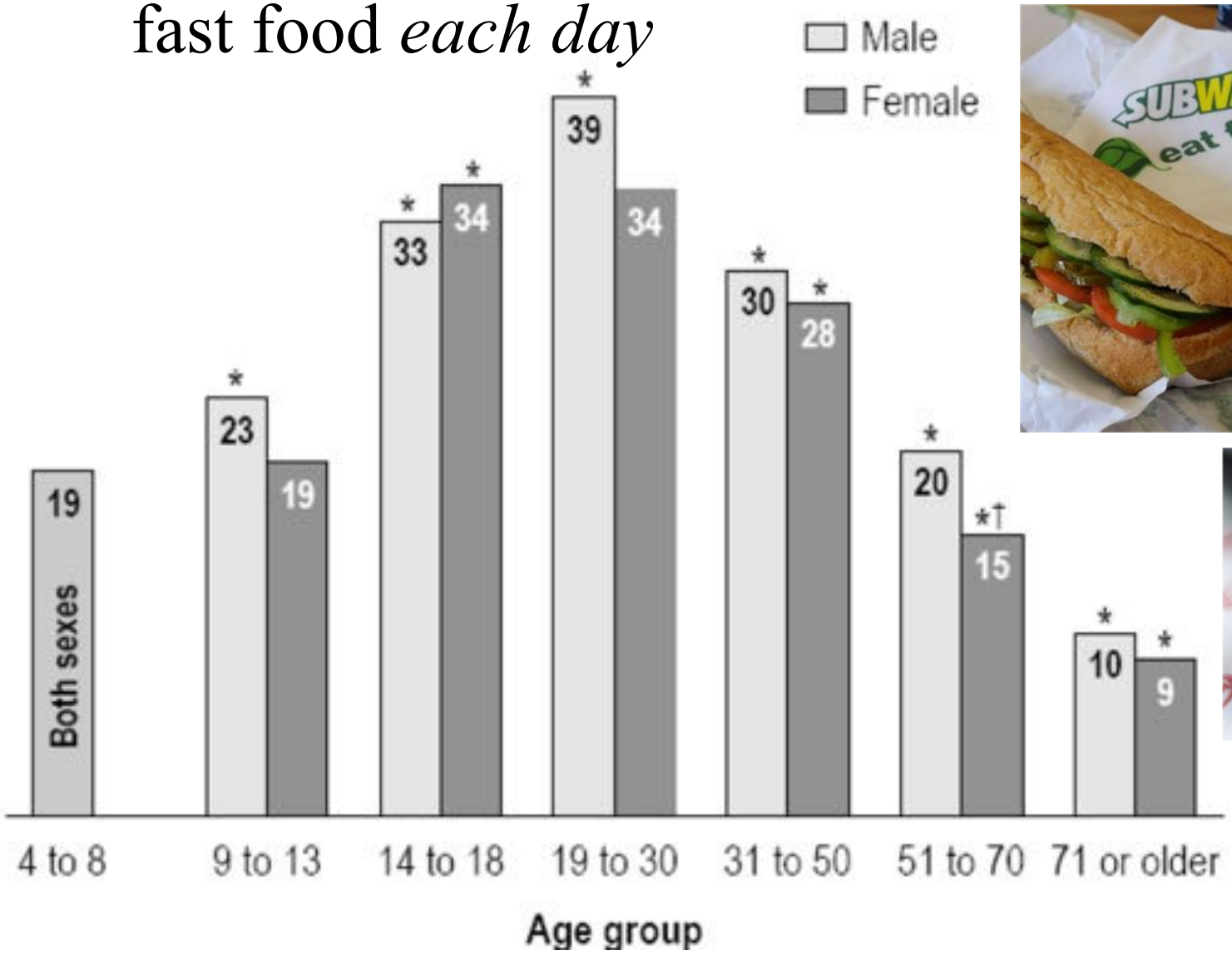
Modern Canadian Diet

- More calories from *snacks* than from *breakfast*
- Most snack calories are “other foods”
- Numbers are % of daily calories from snacks



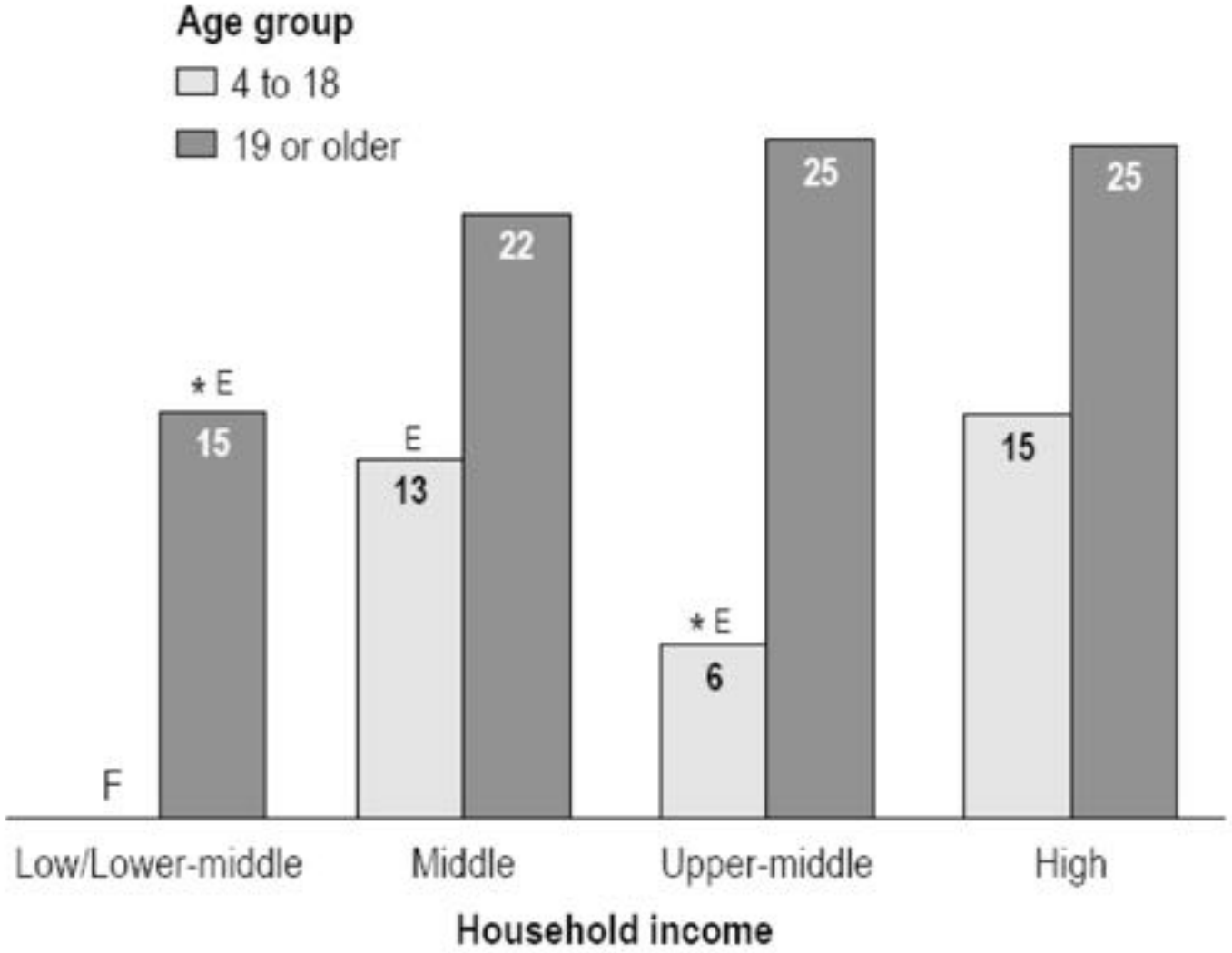
Modern Canadian Diet

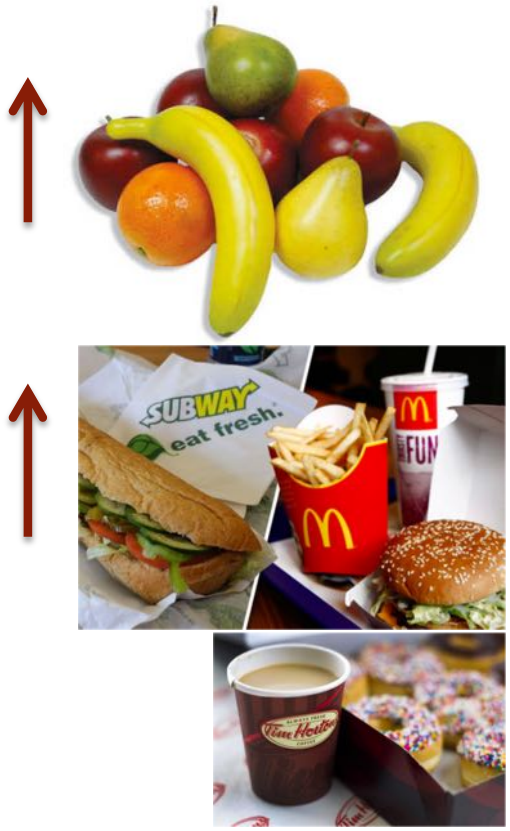
- Fast-food consumption
- Numbers are % of population consuming fast food *each day*



Modern Canadian Diet

- Diet and income – fat intake
- Numbers are % above upper end of recommended range of total calories from fat





A timeline of the human diet

3.2 million years

- "*Lucy*" – our most ancient human ancestor
- Essentially similar anatomy to modern human

1.2 million years

- Oldest direct evidence of diet
- Mostly plants & meat, likely all raw

0.8 million years

- Oldest evidence of cooking
- Smaller mammal & birds, plants & seeds

25000 years

- Cultivating crops & livestock

Human anatomy evolved to eat food – specifically a moderate and mixed-diet

15000 years

- Fermentation of grains (bread, alcohol, etc) & milk (yogurt, cheese, etc)

100 years (1850s to 1950s)

- Industrialized foods & "*fast-food*"

Questions?

We have 10 minutes for questions.

We will start the second half of this session at 3:00 pm if you want to step out for a short break.

Photo of the "fermentation wall" at Agrius Restaurant by Andrew Hendrickson

Nutrition Concepts

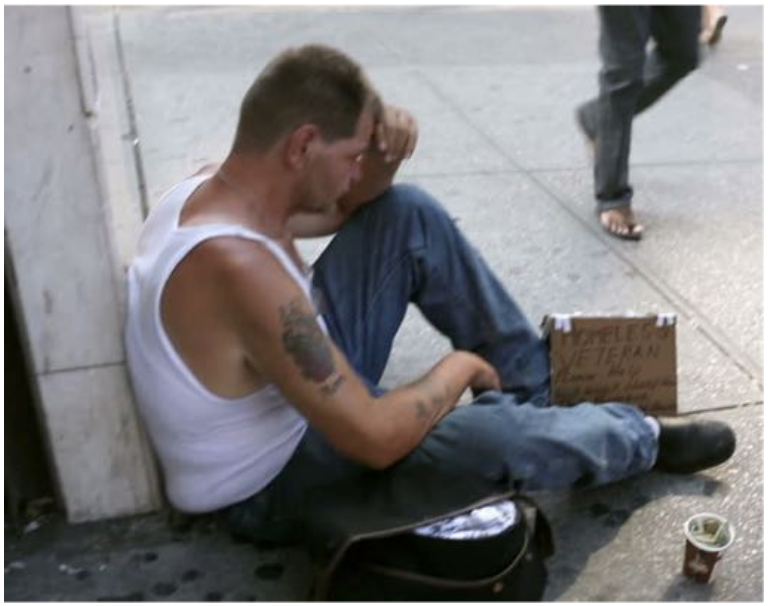
Food is a basic human requirement:

1. Enough to live
2. Variety for optimal health
3. Free from contaminants

1. Enough to Live - *Food Security*

a) Access at all times to safe, nutritious foods
b) Can acquire acceptable foods in socially acceptable ways

Food insecurity exists when either of these conditions cannot be met



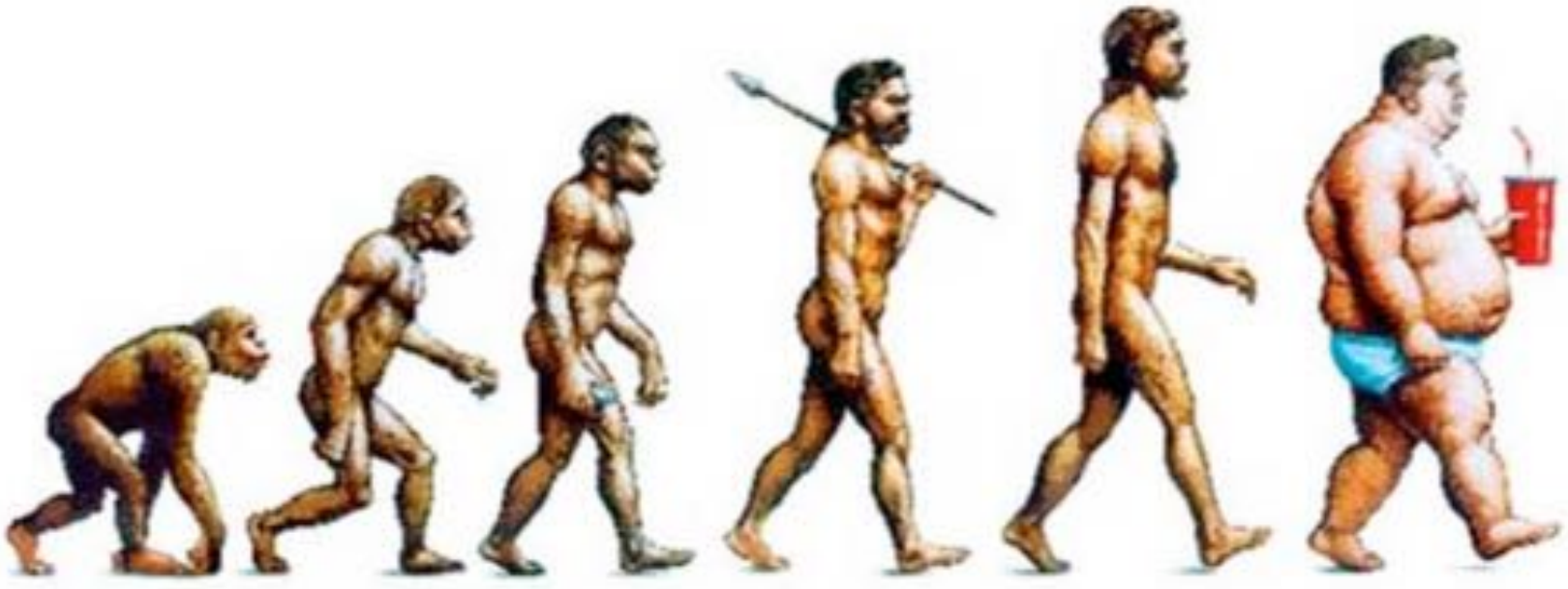
Nutrition Concepts

Moderation, ***variety***, and ***balance*** are key characteristics of a healthful diet

2. Variety for Optimal Health

Poor nutrition can result from both *inadequate* or *excessive* levels of nutrient intake

- Every individual has range of optimal intake for maintaining cell and body function
- Nutrition deficiencies often have *multiple origins*



3. Food Contamination

Food has the potential to be contaminated:

- *Spoilage* (rotting, cross-contamination, etc)
- *Pests* (insects, rodents, birds)
- *Pesticides*
- "*Incidental food additives*"
  - Sanitizers
  - cleaning agents
  - lubricants
  - solvents
  - etc
  - Permitted by Health Canada during processing

Other Food Contaminants

Synthetic chemicals can persist and even accumulate in foods

These residues can include

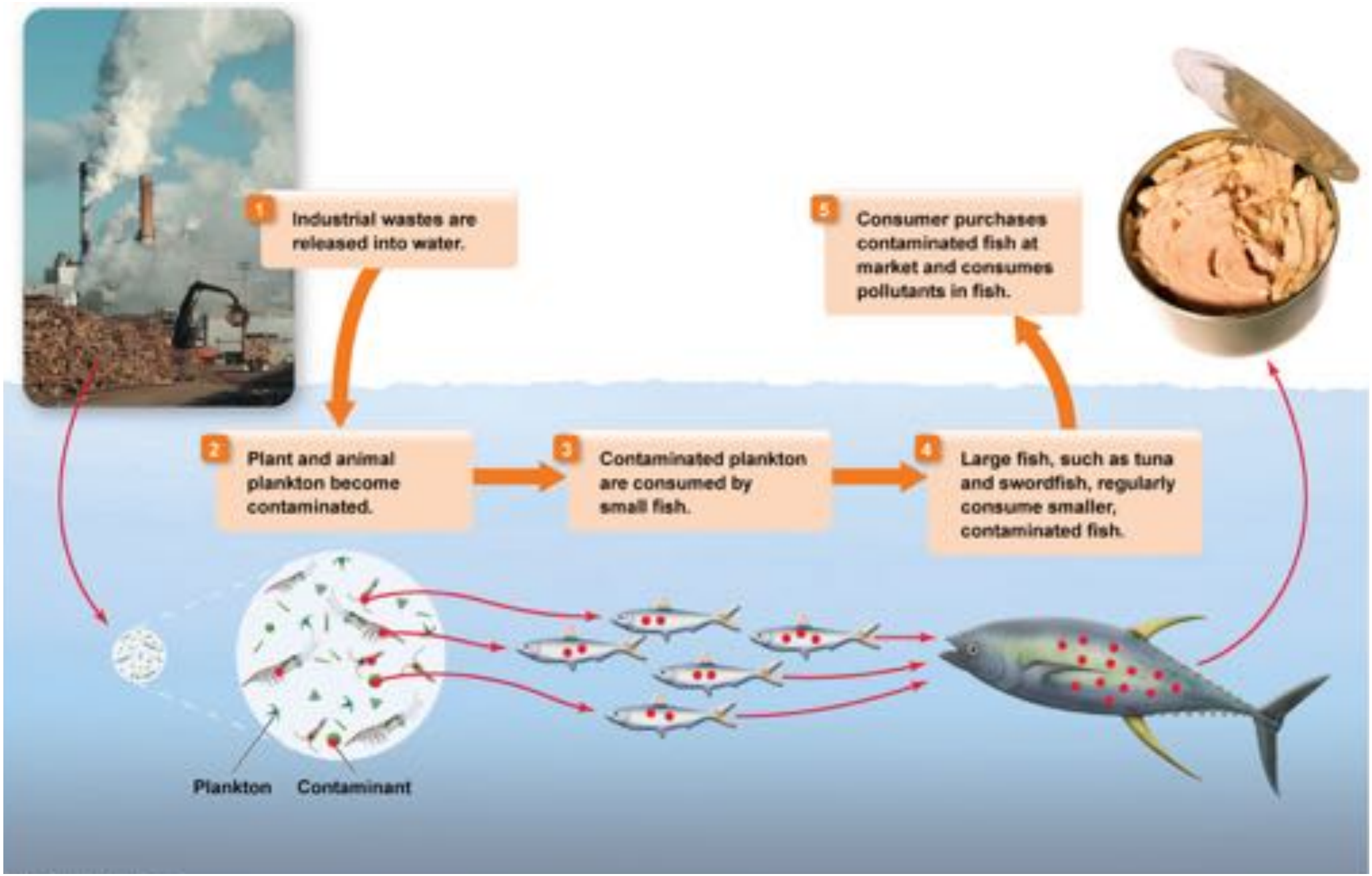
- Persistent organic pollutants (POPs)
- Insecticides, herbicides, and fungicides
- Growth hormone

Persistent Organic Pollutants (POPs)

Persistent organic pollutants: chemicals released into the atmosphere from industry, agriculture, automobiles, and waste disposal

- Found in virtually all categories of foods
- Include
  - Mercury and lead
  - PCBs
  - Dioxins

Bioaccumulation of POPs



What Are Food Additives?

Substances *intentionally* put into food to enhance:

- Appearance
- Palatability
- Quality (i.e. prevent spoilage)

Usage is regulated by Canada Food and Drugs Act

50-60 year history of safe consumption BUT still remains controversial

Food Additives

Natural food additives include beet juice, tomato (lycopene) salt, citric acid, etc

Many other additives are *synthetic chemicals* added to food

Additives can be used for adding *flavour*, *colour*, or *nutrients* to foods or to *preserve quality*

Food Additives

Flavourings

Flavouring agents such as *essential oils* or *spices* are used to replace flavour lost during processing

Flavour enhancers do not have flavour of their own

e.g. *malitol* or

monosodium glutamate (MSG)

Food Additives

Colourings

Beet juice (purple) or lycopene (red), beta-carotene (yellow), & caramel (brown) are natural colouring agents

Vitamins & Minerals

- Vitamin E, ascorbic acid (vitamin C) are added as antioxidants & as nutrients
- Vitamin D, calcium, folate, & iodine are added as nutrients

Other Food Additives

Examples

Texturizers, *stabilizers*, *thickening agents*, or *emulsifiers* that change the consistency of processed foods

Lecithin, Xanthan, other 'gums', Phosphates…

Humectants and *desiccants* that maintain proper moisture levels

Wood pulp, Silica gel, Propylene glycol, Lactic acid…

Bleaching agents that change the colour of the food

Benzoyl peroxide, Calcium peroxide, Nitrogen dioxide, Chlorine…

Incidental food additives

See earlier slide

What is Food Safety?

Food-borne illness: illness transmitted from food or water that contains an *infectious agent*, *poisonous substance*, or a *protein* causing an **immune reaction**

- 4 million Canadians (1 in 8) report food-borne illness each year
- Many more cases go unreported
- **23 people died** during *2008 Maple Leaf Foods product recall*
- *More recalls in Canada every week!*

Government Regulators

Multiple government agencies are involved in ensuring the safety and quality of the food supply

CANADIAN FOOD INSPECTION AGENCY

- Canadian Food Inspection Agency (CFIA) is responsible for the enforcement of 14 federal acts, and report to Health Canada
- Public Health Inspectors
  - local health units (e.g. VIHA)
  - Check out your local favourites!

http://www.healthspace.ca/Clients/VIHA/VIHA_Website.nsf/Food-Frameset

Food Production

- Has become increasingly complex
- Oversight has decreased
- More foods are mass produced
- Ingredients come from various sources
- Contamination can occur at any point from farm to table

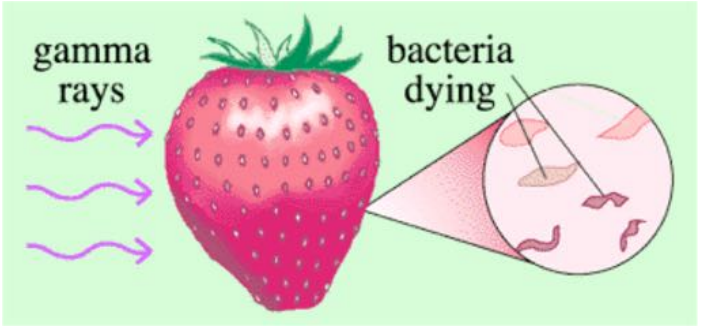
Preventing Food Spoilage

Spoilage can be prevented by many natural & sometimes ancient techniques

- Salting or sugaring
- Drying the food
- Smoking
- Cooling
- Fermenting

Preventing Food Spoilage

Modern techniques include;



- Irradiation
- Pasteurization
- Aseptic packaging, modified atmosphere packaging, high pressure processing
- Chemical preservatives (BHT, propionic acid, sulphites, nitrates and nitrites)
- Industrial canning

Practically Speaking…

How can you track what you're eating?

- Volume versus Mass

or

- What are the advantages to weighing food instead of measuring volume?

- EatTracker.ca

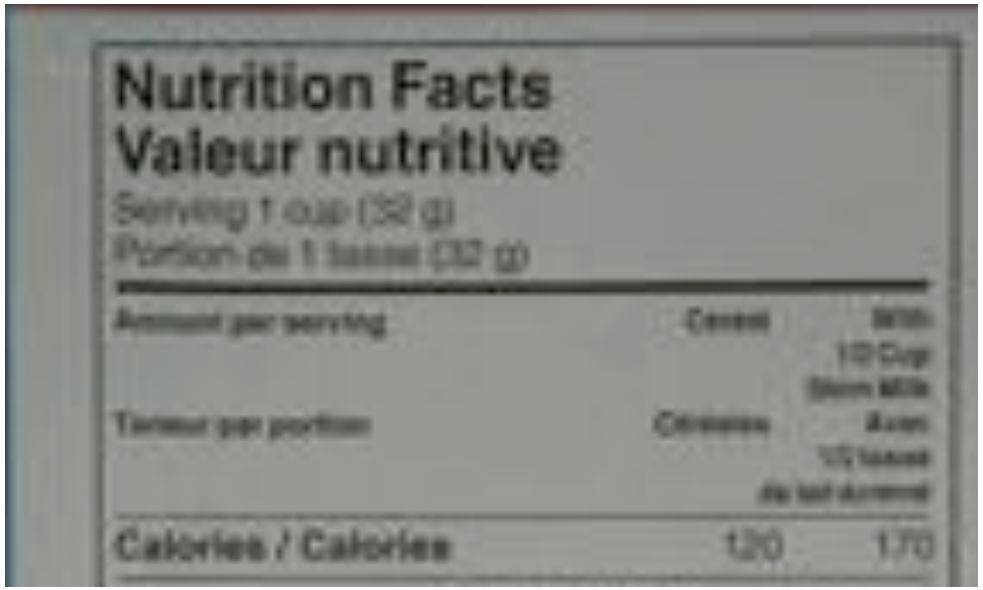
eaTracker.ca
Brought to you by *Dietitians of Canada*

- USDA Food Search Tool

USDA

USDA Food Composition Databases

Special K cereal



Specific amount of food

Compare it to the amount you eat.

Nutrition Facts "Serving"	Amount you eat
Bran cereal with raisins	Bran cereal with raisins
1 cup (59 g)	1 ½ cups
	

Questions?

We have about 10 minutes for questions and will return next week for:

Part 2: Food Trends – organic, GMO, gluten-free, keto-diets and more!

Photo of the "fermentation wall" at Agrius Restaurant by Andrew Hendrickson