Faculty/Presenter Disclosure

- **Faculty:** Russell de Souza

- **Relationships with commercial interests:**
  - **Grants/Research Support:** Canadian Institutes for Health Research, Canadian Foundation for Dietetic Research, Population Health Research Institute, McMaster Department of Health Research Methods, Evidence, and Impact
  - **Speakers Bureau/Honoraria:** McMaster Pediatrics Day, McMaster Graduate Student Wellness Initiative
  - **Consulting Fees:** Canadian Institutes for Health Research, Health Canada, World Health Organization's Nutrition Guidelines Advisory Group
  - **Other:** Employee of McMaster University

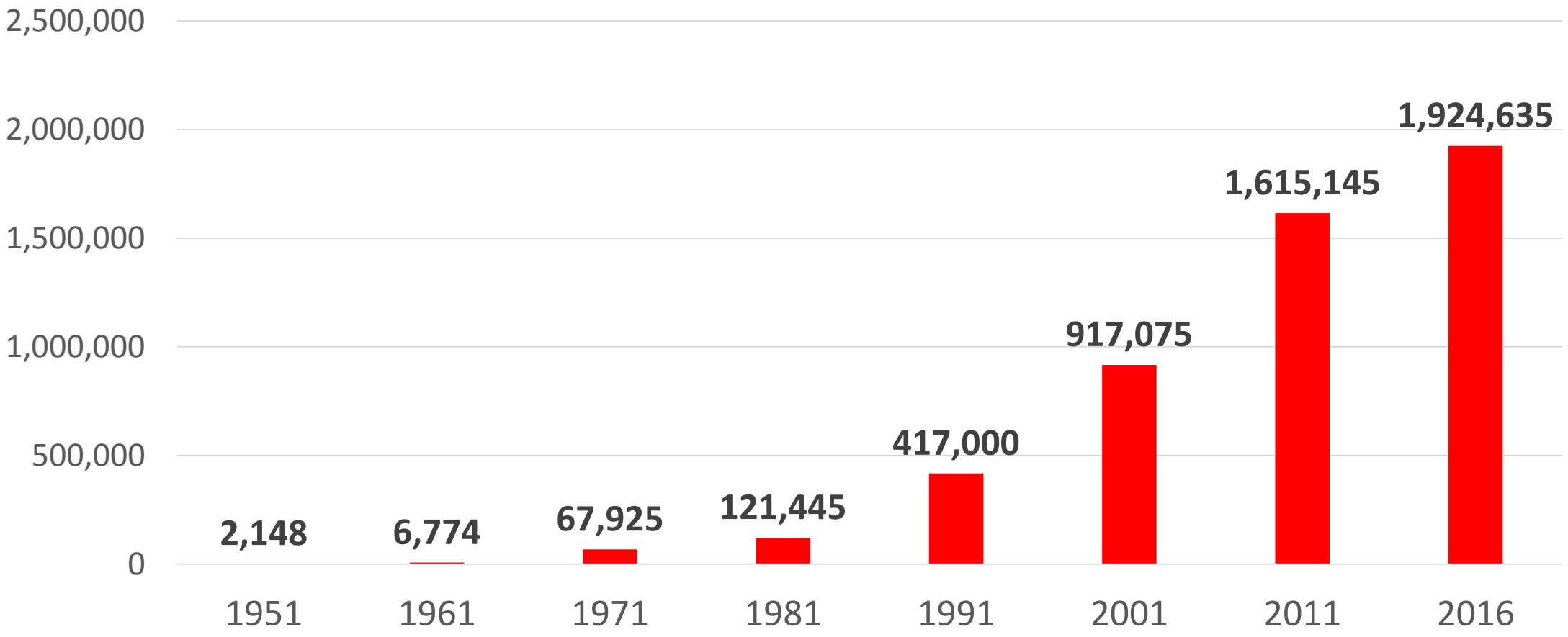
The optimal South Asian diet for health

Is there such a thing?

What is the target population?

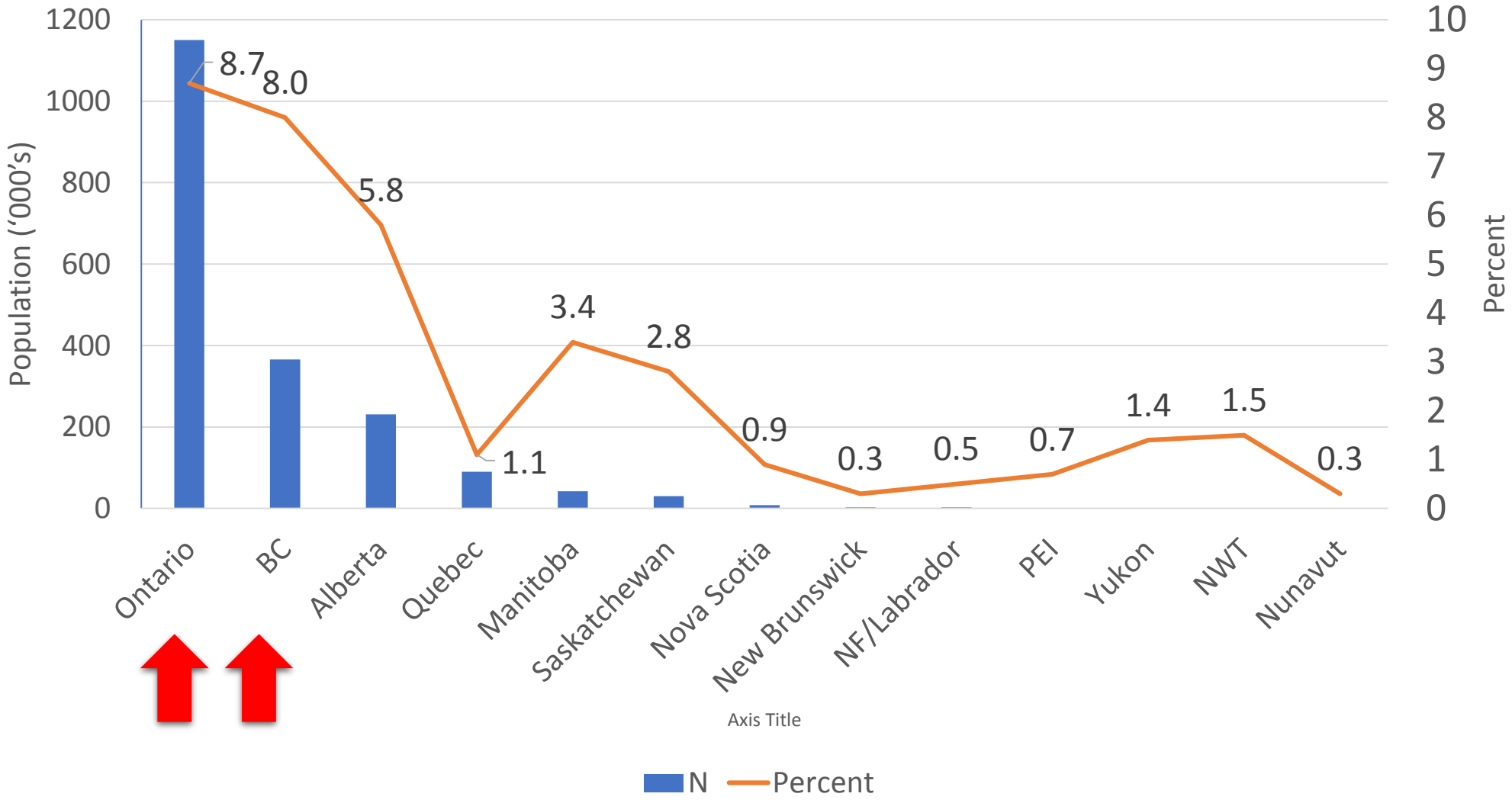
- South Asians
  - India, Pakistan, Sri Lanka, Nepal, Bangladesh
- About 2,000,000 Canadians

The South Asian population in Canada is growing

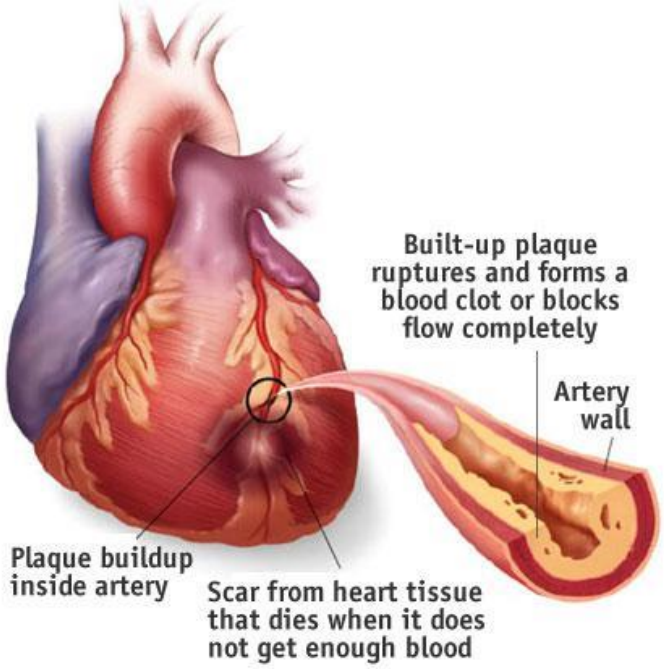


https://en.wikipedia.org/wiki/South_Asian_Canadians

Predominantly in Ontario and BC



https://en.wikipedia.org/wiki/South_Asian_Canadians

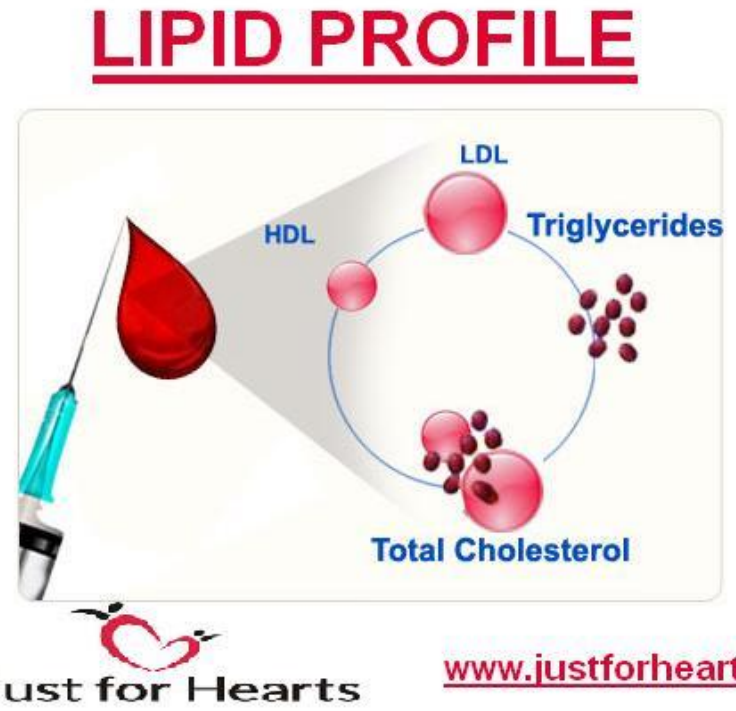


South Asians are at a higher risk of CVD

- Higher age-standardized incidence of AMI
  - 4.97 vs. 3.29 per 1,000 for men
  - 2.35 vs. 1.53 per 1,000 for women
- Higher CVD prevalence
  - 5.7 – 10.0% vs. 5.4 – 5.7% compared with White Canadians

Some of this is explained by risk factor profile

- Higher prevalence of type 2 diabetes
  - **2.25 (1.81 to 2.80)**
  - Higher prevalence of IGT
  - Higher fasting insulin
  - Increased insulin resistance
- Lipid profile worse
  - Lower: HDL-C, Apo-A1
  - Higher: TC:HDL-C, triglycericdes, Lp(a), Apo-B:Apo-A1



The South Asian diet may contribute to risk

Traditional diet that changes with acculturation

South Asians in Canada– SHARE study

Nutrient	South Asians (n=58)	White Canadians (n=85)	Recommended	South Asians are…
Energy	**1785**	**2022**		
Protein (g)	67.4	78.8	0.8 to 1.0 g/kg	
Percent Energy	**15.1**	**15.6**	**10-25%**	**In range**
Carbohydrate (g)	254	257	>130 g/d	
Percent Energy	**52.9** ↑	**47.6**	**45-65%**	**In range**
Dietary fibre	18.1 ↑	16.5	20 g/ 2000 kcal	**In range**
Fat (g)	50.9	64.9		
Percent Energy	**25.7%** ↓	**28.9%**	**20-35%**	**In range**
Saturated fat %	**7.5%** ↓	**9.9%**	**<10%**	**In range/NCEP II**
Polyunsaturated fat %	**5.3%**	**4.7%**	**6%**	**Little low**
Monounsaturated fat %	**9.7%**	**10.9%**	**10-20%**	**In range**
Cholesterol (mg)	161 ↓	251	<200	In range
Alcohol (g)	2.8 ↓	8.7	<2 drinks/d	In range/low
Vitamin B12 (ug)	6.8 ↓	14.4	2.4	In range

Kelemen et al., J. Am. Diet. Assoc, 2003

Food grouping	Western	Vegetarian
Variance explained	11.8	10.4
Added fat	0.24	-
Alcohol	-	-0.24
Coffee	0.30	-
Eggs	0.24	-
Fish	0.33	-
Fried snacks	0.22	-
High fat dairy	0.29	
Sugar-sweetened beverages	-	0.41
Legumes	-	0.30
Nuts	-	0.23
Pizza	0.30	-
Potatoes	0.22	-
Poultry	0.38	-
Red meat	0.29	-
Rice	-	0.47
Snacks	-	0.42

Dietary Patterns - MASALA

- Used principal components analysis to find dietary patterns
- Two emerged:
  - Western
    - more alcohol, more time in U.S., more men, more smokers
  - Vegetarian
    - 35% reported “strong” Indian beliefs
- Vegetarian diet
  - *Lower* fasting glucose (P=.02)
  - *Improved* insulin sensitivity (P=.02)
  - *Lower* HDL-C (P=.09)

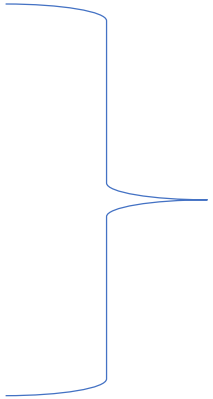
Gadgil et al., J. Acad Nutr Dietetics, 2014

The impact of acculturation

- Due to immigration policies, many newly-arrived South Asians are healthier than age-matched Canadians
  - “Healthy Immigrant” effect

The impact of acculturation

- But this advantage **diminishes** over time, with acculturation
  - Cultural
  - Socio-economic
  - Psychosocial
  - Lifestyle
  - Social support



Dietary acculturation

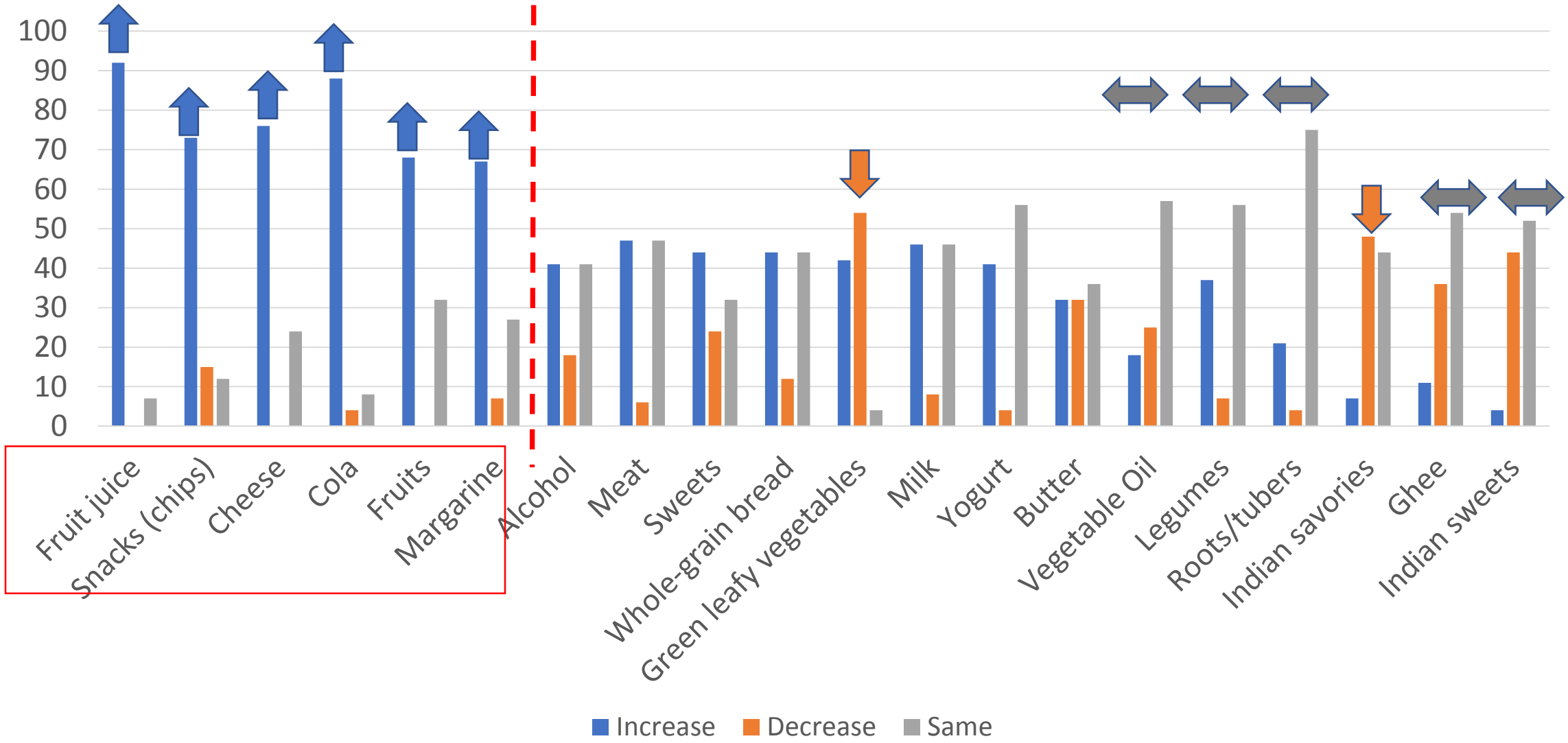
- Adoption of the dietary habits of their host country

Ethnic neighbourhoods

What of the following foods are most likely to increase in the diet with immigration?

- A) Fruit juice
- B) Cola/soft drinks
- C) fruit
- D) margarine
- E) all of the above

What changes? 40 recent immigrants (≤10 y)

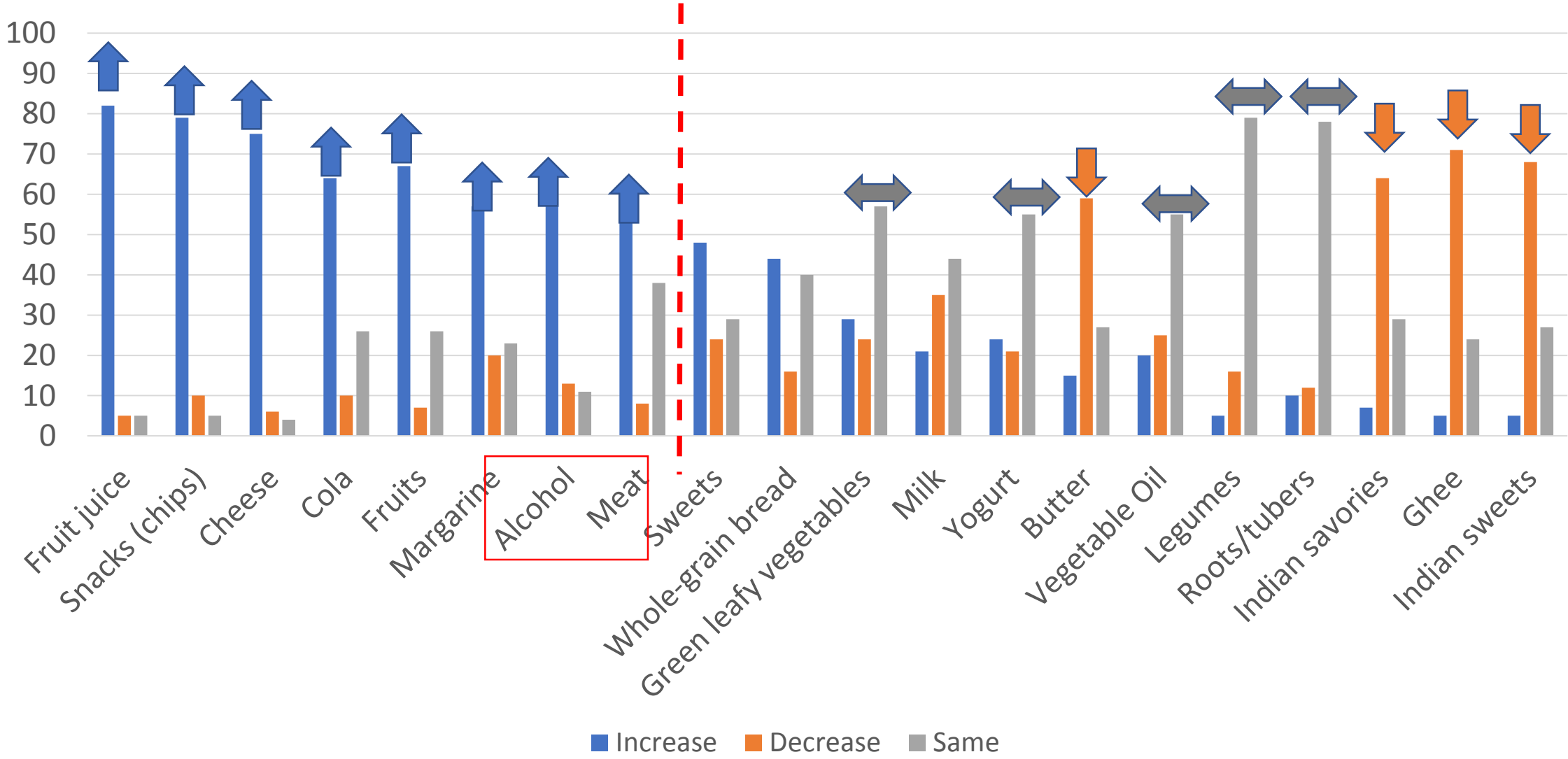


Raj et al., J. Am. Diet. Assoc, 1999

In more “long-standing” immigrants, which foods are likely to have increased?

- A) alcohol and meat
- B) green leafy vegetables and whole-grain breads
- C) legumes
- D) root vegetables/tubers
- E) ghee and sweets

What changes? 26 Long-term residents (>10 y)



Raj et al., J. Am. Diet. Assoc, 1999

Brampton

What changes? N=874 MASALA participants

Nutrient	1st tertile (15.1 y)		2nd tertile (27.1 y)		3rd tertile (39.4 y)		P-trend
	Mean	SE	Mean	SE	Mean	SE	
Energy	1762	30	1677	29	1609	32	.0004
Carb (%)	57.4	0.4	56.7	0.3	55.0	0.4	<.0001
Protein (%)	14.9	0.1	14.6	0.1	14.4	0.1	.02
Fat (%)	28.3	0.3	29.1	0.3	30.3	0.3	<.0001
Sat Fat (g)	14.6	0.3	14.7	0.2	15.5	0.3	.04
Poly fat (g)	12.0	0.2	12.2	0.2	12.3	0.2	.40
n-3	0.14	0.01	0.14	0.01	0.13	0.01	.78
n-6	0.34	0.01	0.37	0.01	0.39	0.01	.04
Trans fat (g)	0.11	0.01	0.13	0.01	0.15	0.01	.003
Fibre (g)	20.8	0.3	21.1	0.3	19.8	0.3	.02
Glycemic index	41.2	0.4	39.8	0.3	39.4	0.4	.001
Glycemic load	93.1	1.1	89.1	1.1	85.4	1.2	<.0001

Talegawkar et al., Public Health Nutr., 2016

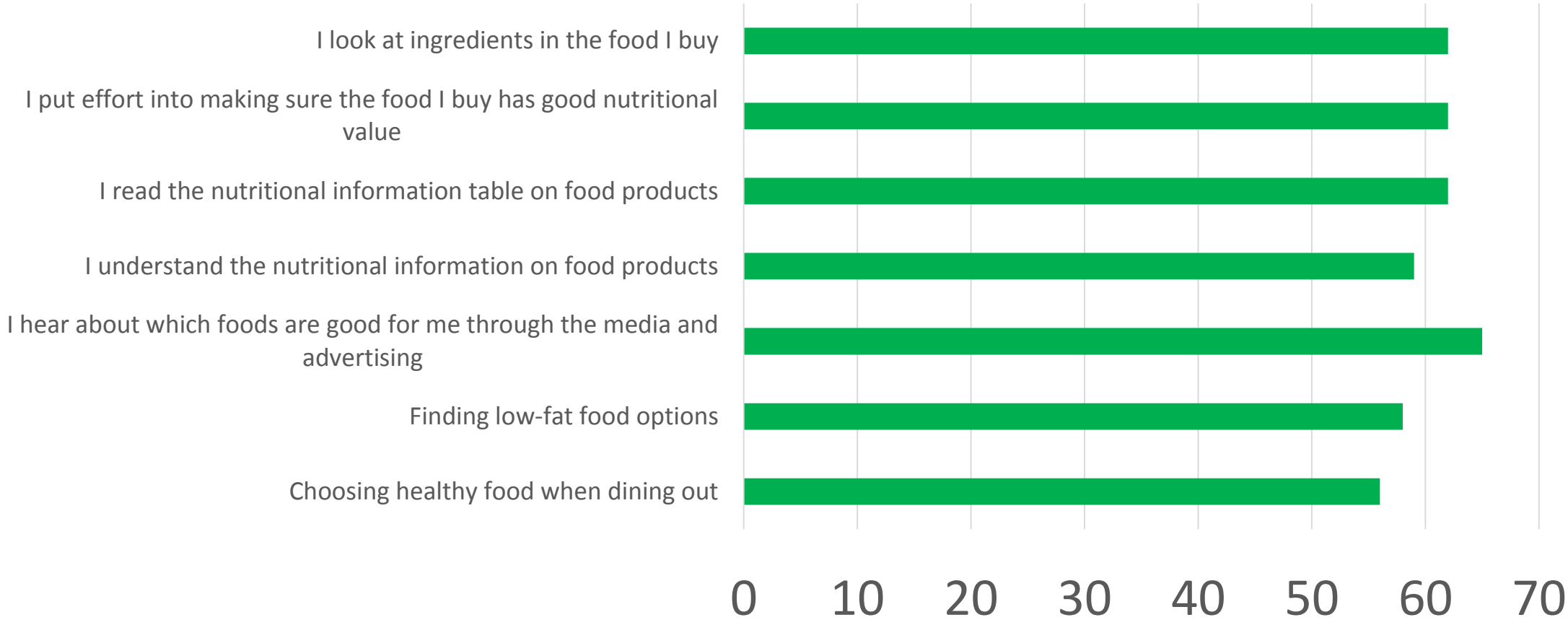
What changes? N=428 high DM risk SA in BC

Nutrient	Q1 (0-11 y)		Q2 (11-21.5 y)		Q3 (21.6-39 y)		Q4 (>39 y)		P-trend
Fat intake									
Total fat	13.2	5.0	14.0	5.6	13.9	6.2	14.8	6.1	0.74
Meat	**0.40**	**0.99**	**0.79**	**1.6**	**0.84**	**1.6**	**1.5**	**2.5**	**<.001**
Whole milk	**3.6**	**0.8**	**3.6**	**0.8**	**3.3**	**1.2**	**3.3**	**1.0**	**.009**
Indian-specific*	**2.4**	**1.7**	**2.4**	**1.8**	**1.0**	**1.4**	**1.7**	**1.7**	**.007**
Fruit/Vegetables/Fibre									
Total FVF	**15.0**	**4.6**	**13.6**	**4.0**	**15.6**	**5.2**	**16.0**	**4.9**	**.001**
Fruit	4.6	1.7	4.0	1.8	4.7	2.2	4.0	2.1	.28
Non-starchy	**1.6**	**1.1**	**1.5**	**1.1**	**1.8**	**1.0**	**1.0**	**1.2**	**.022**
Starchy	2.1	1.0	2.1	1.0	2.3	1.0	2.2	1.0	.21

*South Asian desserts (e.g. Jalebi, gulab jamun, ladoo, etc.)
South Asian snacks (e.g. bjujia, papad, mathi, samosas, pakora, salted fried nuts
"whole milk" (including yogurt, dahi)

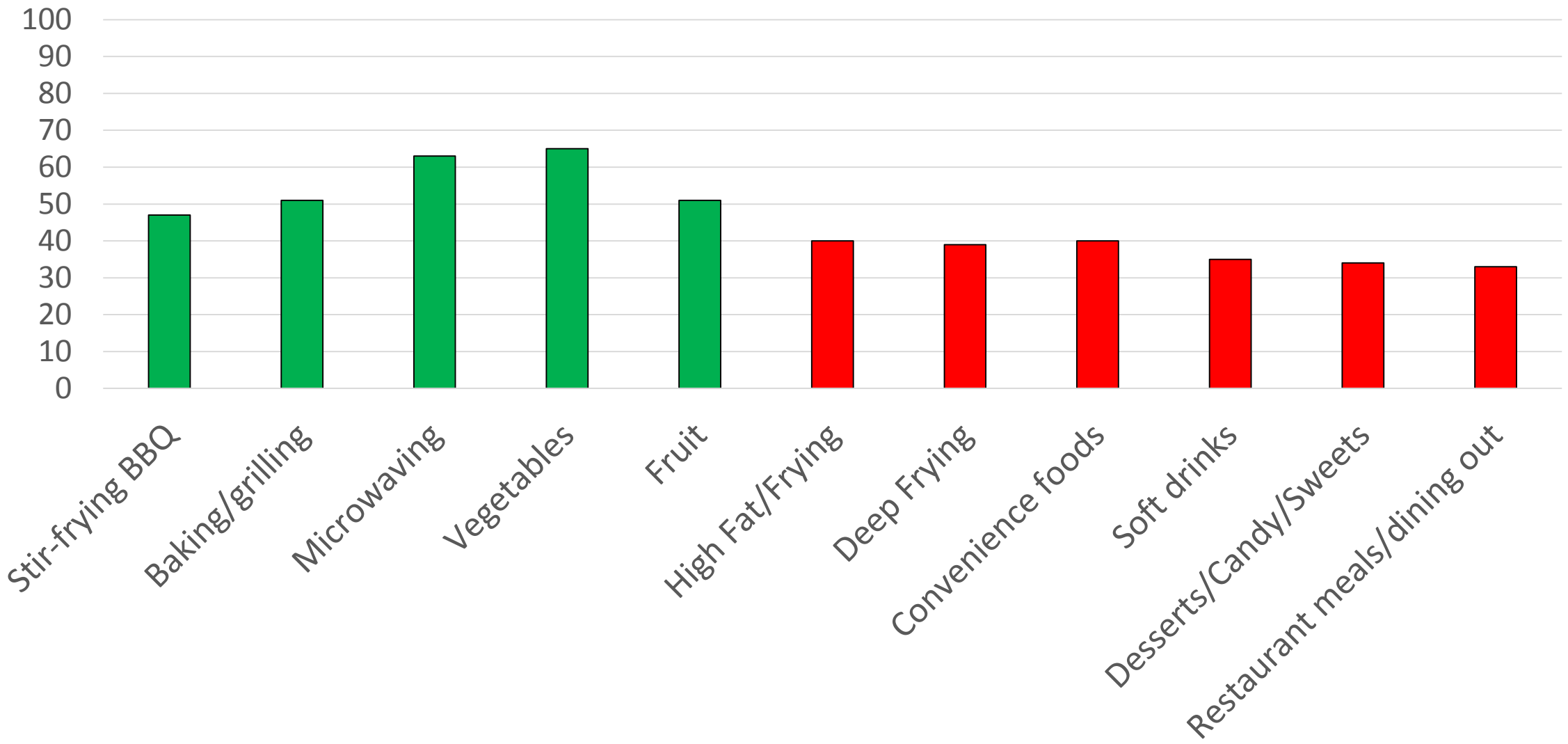
Kandala et al., J Diab and Compl, 2016

How do attitudes change?
N=129 M-CHAT participants



Lesser et al., PLOS ONE, 2014

What changes? N=129 M-CHAT participants



Lesser et al., PLOS ONE, 2014


Indiana

Recent research suggests that which of the following underlying issues may predict sweet intake?

A) Low physical activity

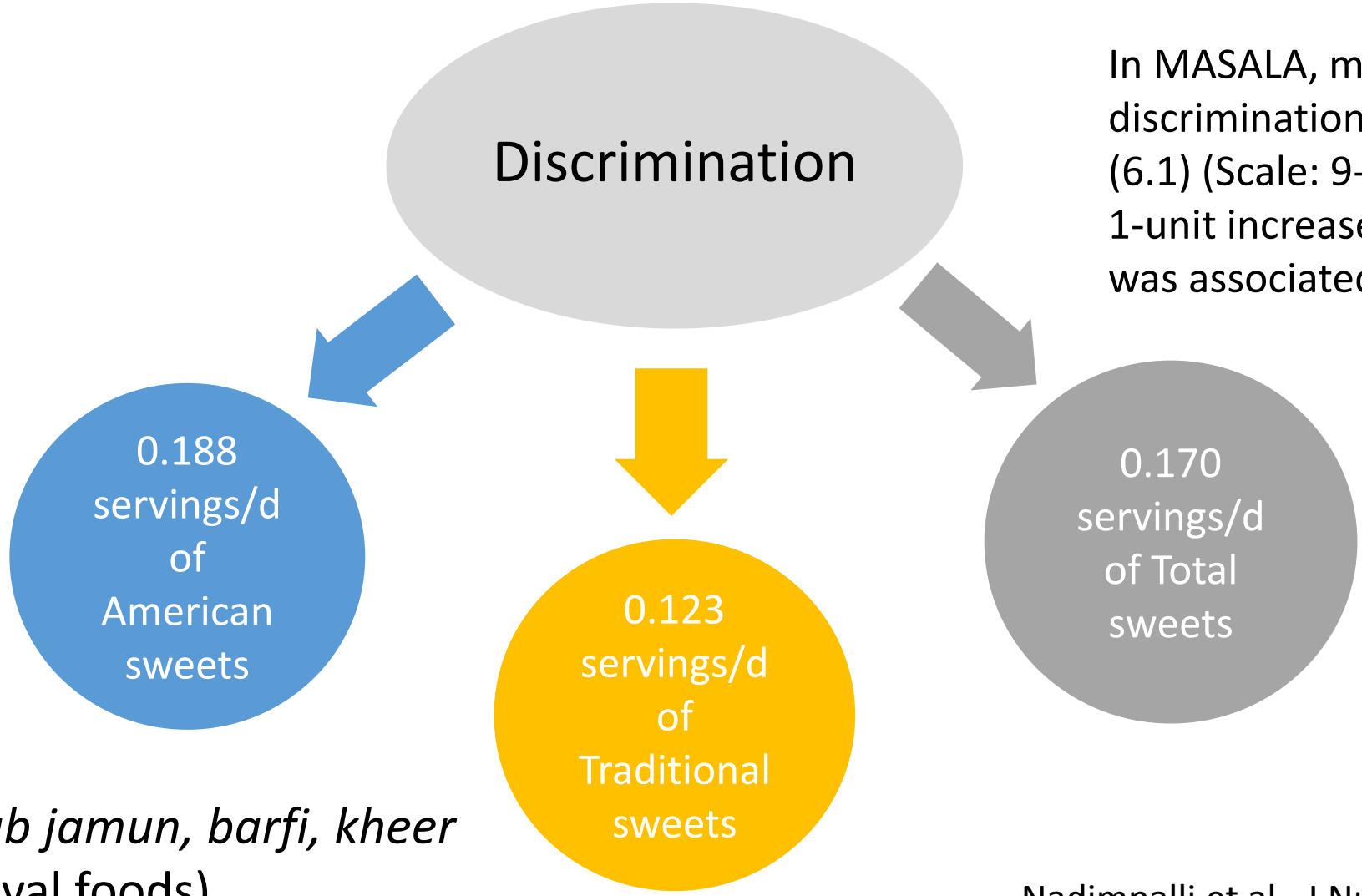
B) Weight gain

C) Feelings of discrimination

D) High fat intake

E) A high meat diet

Why are these changes made?



In MASALA, mean discrimination was 15.1 (6.1) (Scale: 9-54).
1-unit increase in score was associated with:

-gulab jamun, barfi, kheer (festival foods)

Nadimpalli et al., J Nutr Educ Behav, 2017

So what changes can we make?

- To a high-carbohydrate diet that emphasizes sweets?
- **Replace with what?**

Replacing carbohydrate with protein may be expected to?

A) Increase risk of type 2 diabetes

B) Raise HDL-C

C) Decrease Waist-to-hip ratio

D) Improve satiety

E) All of the above

What are the implications of changes for risk?

1. When carbohydrate increases and protein decreases, HDL-C decreases:

   -replacing 100 g of protein with 100 g of carbohydrate = -0.15 mmol/L

   -fewer servings of soft drinks, juices, and snacks:

   1.22 mmol L vs. 1.11 mmol/L (P=0.02)

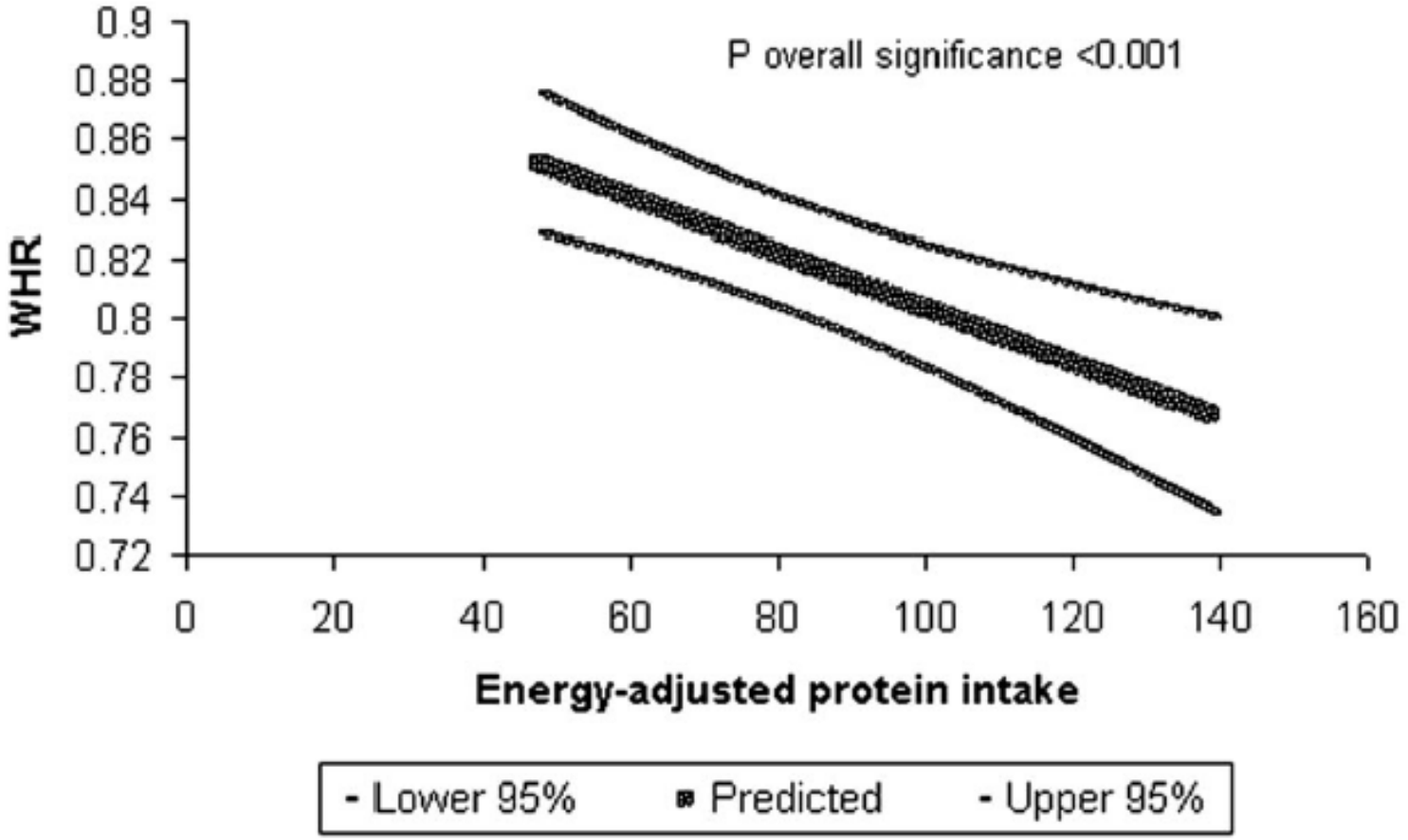
   -fewer servings of white bread, rice, potatoes

   1.15 mmol/L vs. 1.20 mmol/L (P=0.41)

Merchant et al., Am J Clin Nutr, 2007

What are the implications of changes for risk?

2. When protein **increases** and carbohydrate **decreases**, **WHR decreases**:



Merchant et al., J Nutr, 2005

What are the implications of changes for risk?

3. Higher protein (per 15-g) increases risk for type 2 diabetes:
   - Meat protein (animal + fish) P=0.07
   - Vegetable protein P=0.26

	Standardized Odds Ratio	95% Confidence Interval	*p* Value[a]
Unadjusted model	1.47	1.02–2.12	**0.04**
Minimally adjusted model[b]	1.85	1.20–2.84	**0.005**
Fully adjusted model[c]	1.70	1.08–2.68	**0.02**
Previously unknown, laboratory-diagnosed diabetes	1.65	0.95–2.87	0.08

[a] Significant values shown in bold-faced type.

[b] Adjusted for age and sex.

[c] Adjusted for age, sex, waist circumference, and hypertension.

MASALA = Metabolic Syndrome and Atherosclerosis in South Asians Living in America.

Wang et al., J Am Coll Nutr, 2010

What interventions have be tried?

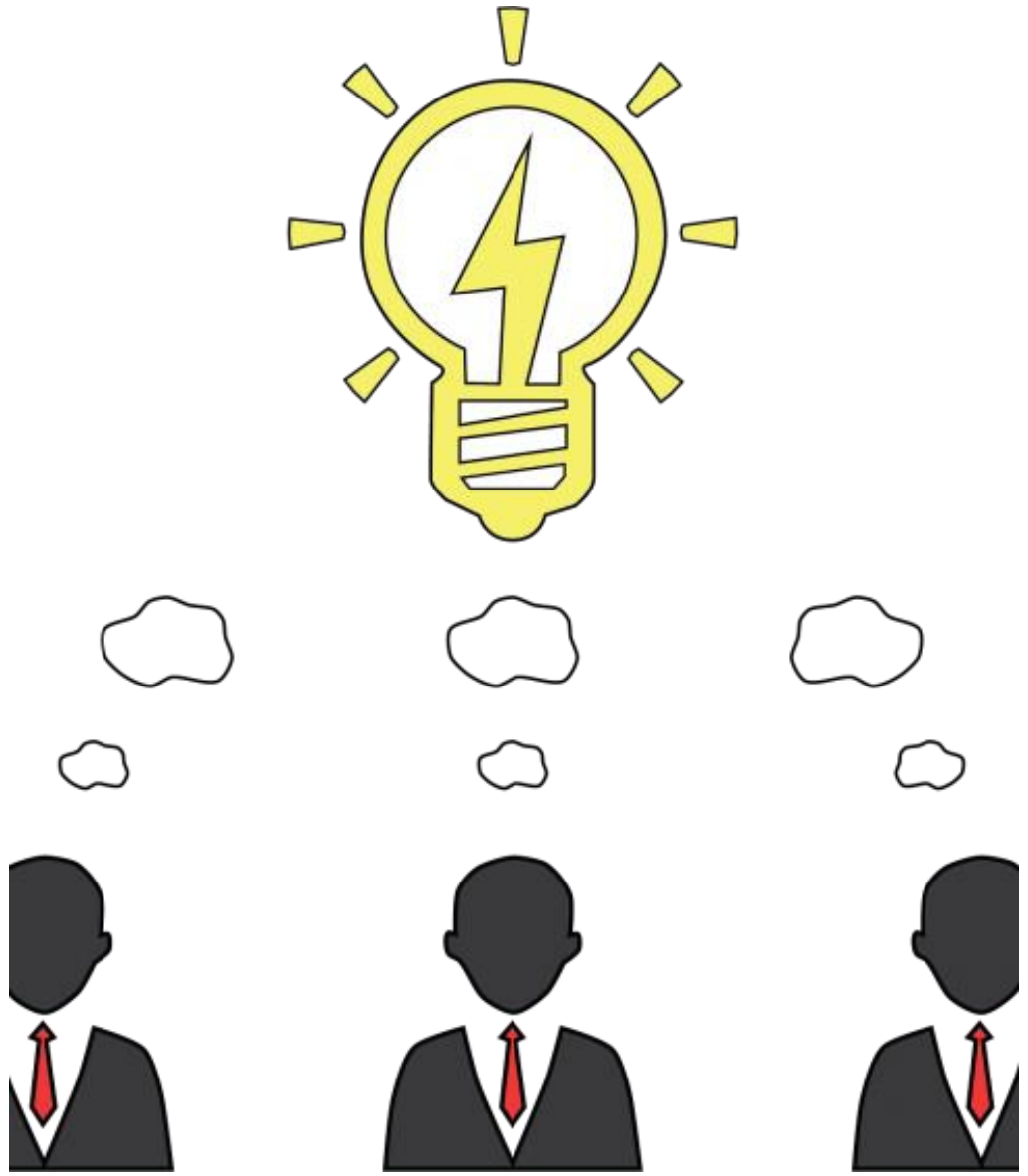
- **SAHARA**
  - 12-month digital health intervention to change diet physical activity
  - Community-based (ON, BC)
  - Age 30+ free of CVD
  - N=343, aged 50.6 (11.4), 52% men

	DHI		Control	
Servings/d	Baseline	12 mo	Baseline	12 mo
Fruits	2.06	2.12	1.88	1.92
Vegetables	2.72	2.70	2.67	2.44
Deep-fried foods	0.25	0.24	0.29	0.25
Salty snacks	0.78	0.71	0.99	0.71
Meat or poultry	0.58	0.51	0.39	0.37

Anand et al., JAMA Cardiol, 2016

What do we need to understand?

1. Dietary change can be difficult and take time
2. South Asians in Canada include many “Western” foods in their meal plans, and continue to eat traditional foods
3. The degree of use of “Western” foods is variable, and influenced by length of time in Canada
4. Individualize dietary advice; consider regional and religious diversity
5. South Asian Canadians are aware of and seeking out nutrition information about specific foods
6. South Asian Canadians adopt both healthy and unhealthy dietary practices–capitalize on the healthy to impact change



1. Dietary changes take time

- Know your starting point; people who make drastic changes are not likely to stick with them
- Diet wasn’t formed overnight—it is the sum of knowledge, beliefs, tastes, and accessibility

2. Become familiar with South Asian foods

- If you see many South Asian participants, it’s helpful to know what is and what is and isn’t consistent with healthy eating practices

3. All South Asian people don’t eat the same!

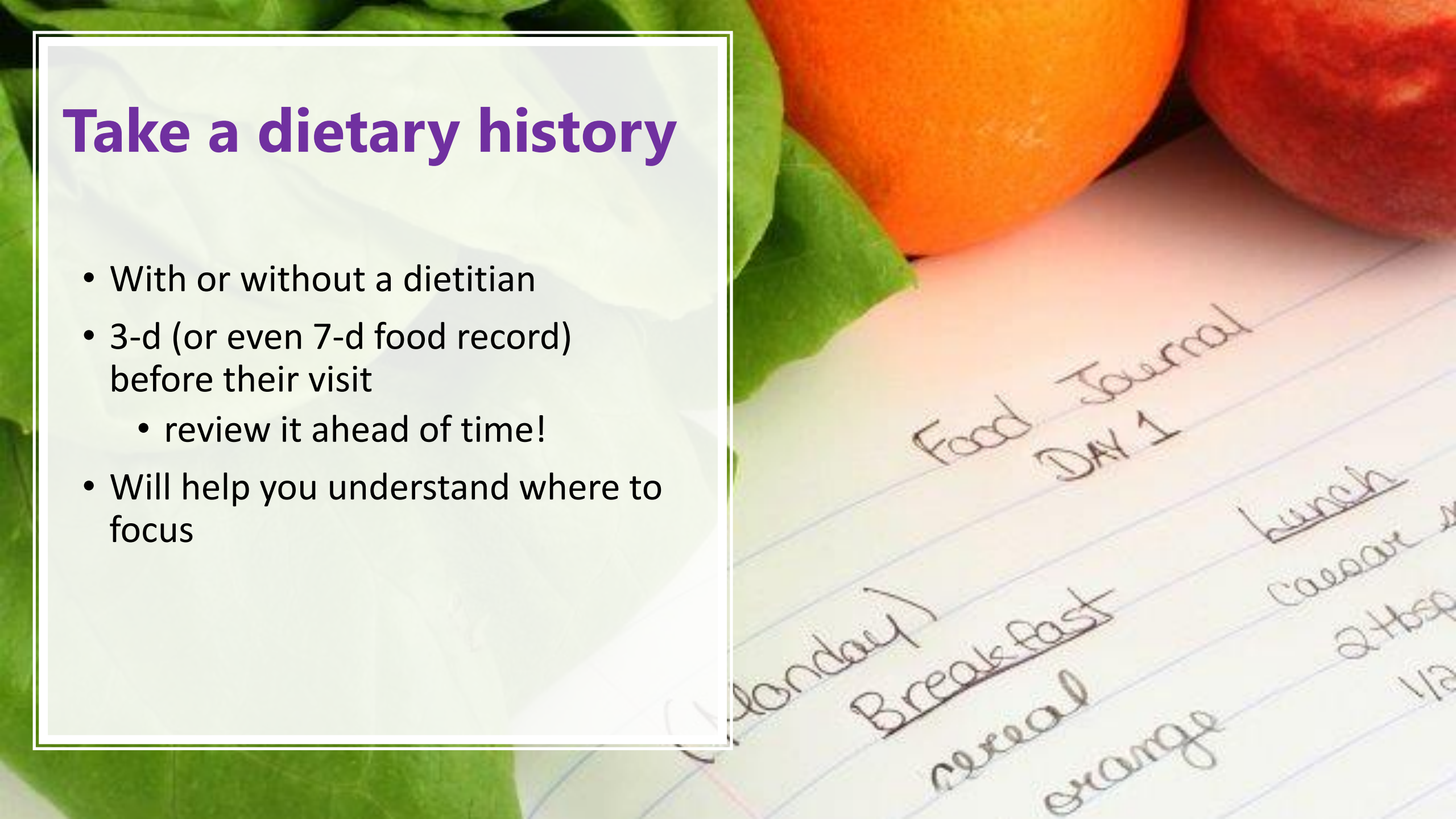
- Diet represents a number of influences
- We’ve seen that time in Canada alters eating habits
- Don’t make assumptions– take a diet history!

4. Individualize dietary advice

- No “one-size-fits-all” approach
- Don’t assume that “just because I’m brown, I eat samosas”
  - [actual quote from a participant in a study]
- Understand what can be changed; and what cannot

Take a dietary history

- With or without a dietitian
- 3-d (or even 7-d food record) before their visit
  - review it ahead of time!
- Will help you understand where to focus

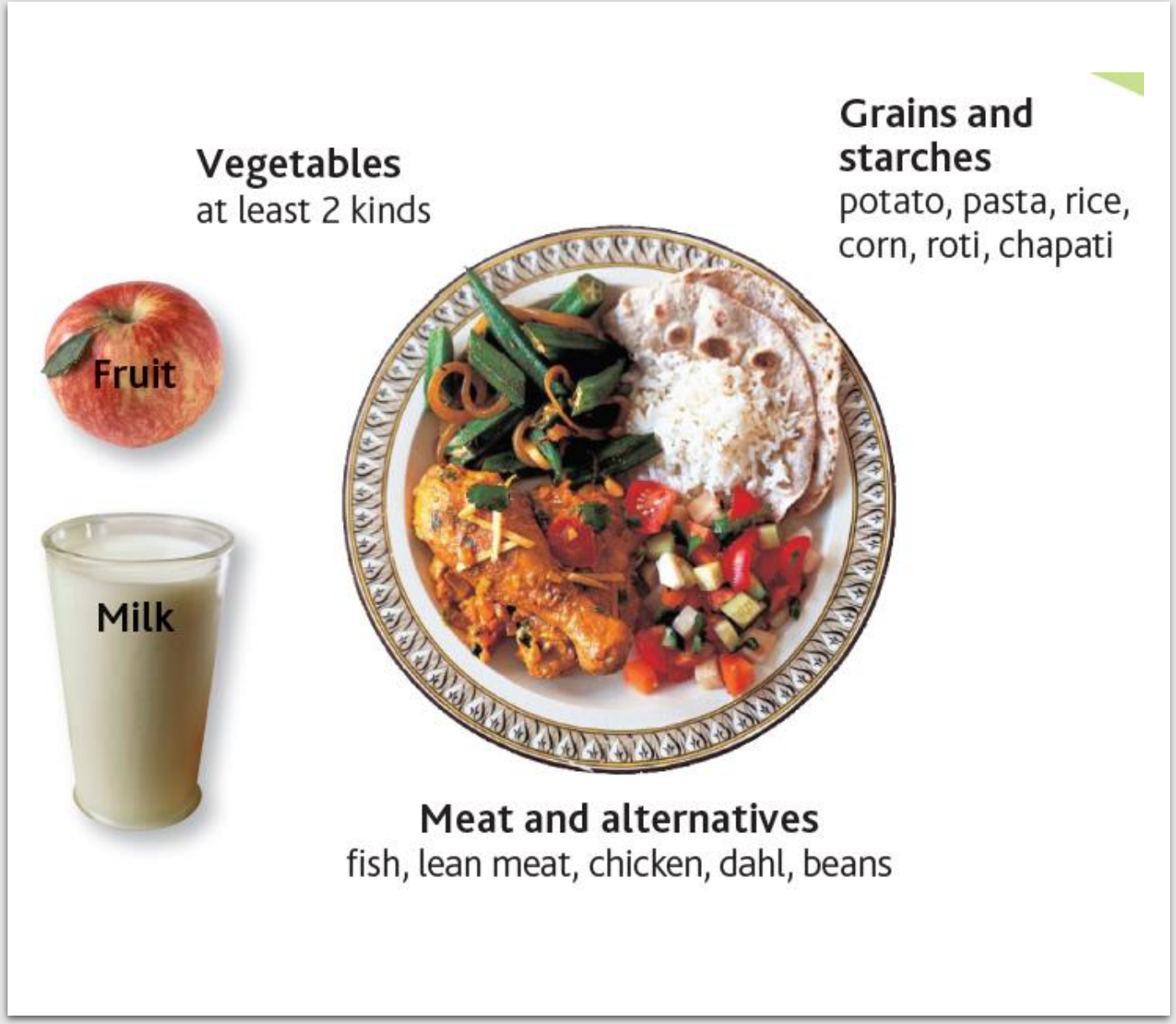


5. Be aware of Resources available

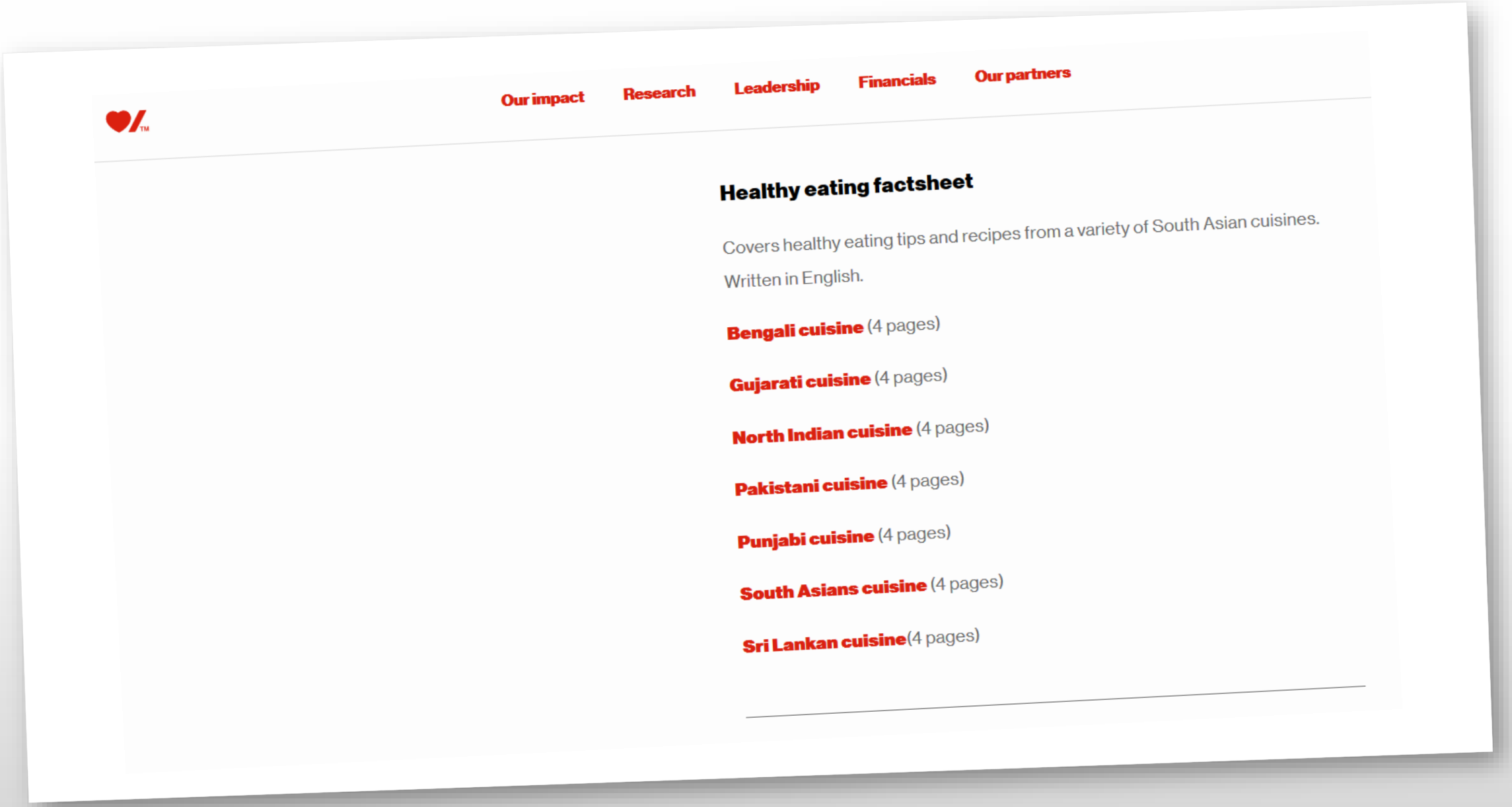
- Your team
- On-line resources

http://www.diabetes.ca/clinical-practice-education/professional-resources/food-nutrition-tools-for-south-asian-populations

Diabetes Canada "Space on your plate"



www.diabetesgps.ca/gps/pdf/EatWell_SouthAsian_EN.pdf



http://www.heartandstroke.ca/what-we-do/publications

Leveraging “the good”

Carbohydrates

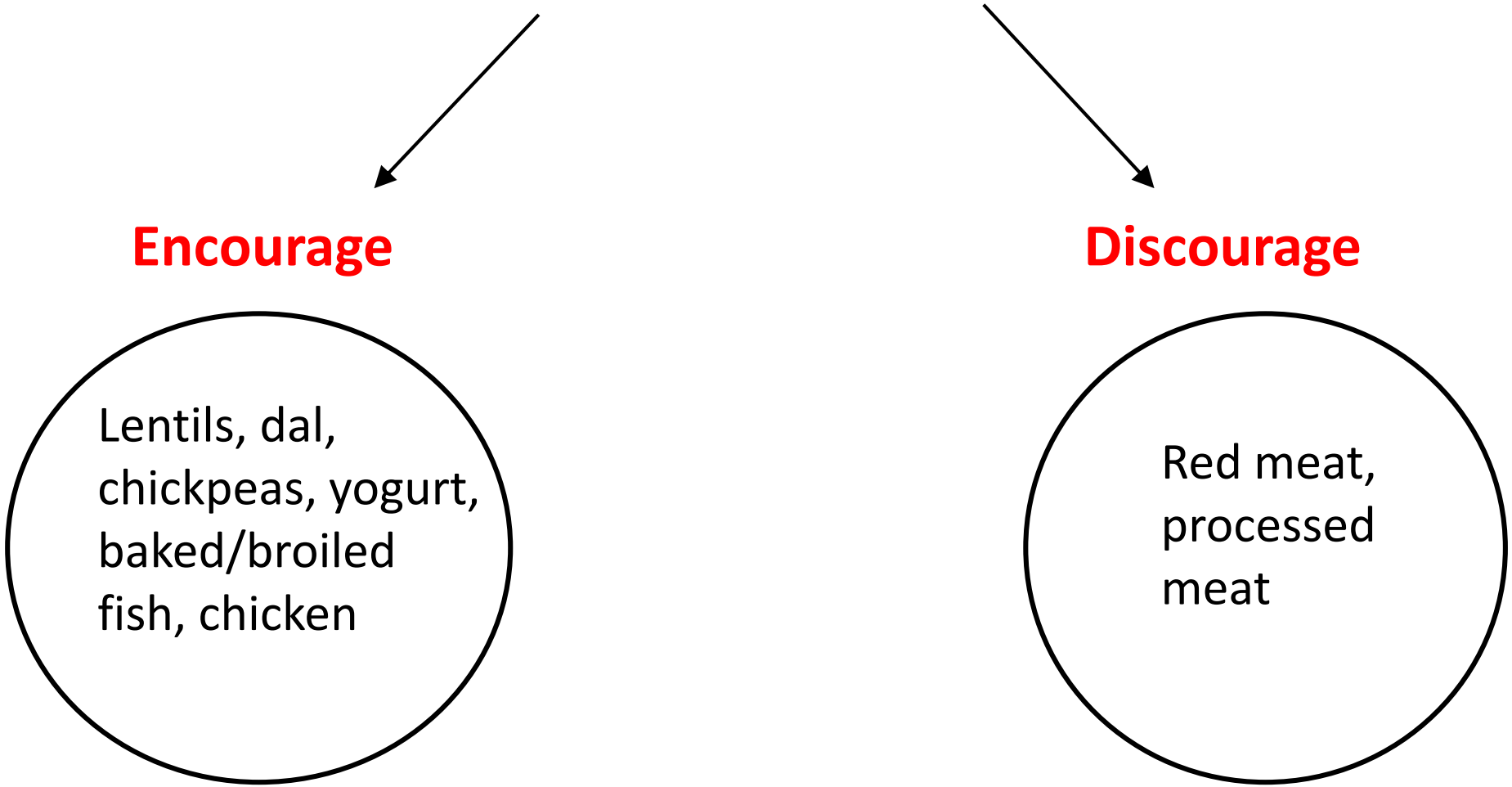
- Lentils, dal, chickpeas
- whole-wheat chapatti, brown basmati rice
- Portion control

White rice, Sweets, sugar-sweetened beverages

Carbohydrates

- Vegetable and fruit (4-5 cups/daily)
  - Dark green, red, orange vegetables, peas, beans
  - More vegetables than fruit; more raw than cooked
  - Green vegetables instead of starchy vegetables
  - Leafy green vegetables and cruciferous vegetables
    - Spinach, cabbage, kale, mustard green
    - Cauliflower, broccoli, Brussel sprouts
- Whole grains
  - Reduce rice when eating potatoes (or other starch vegetables)
  - Make chapatti with 100% whole-wheat flour
  - Try using other grains (quinoa, barley, oats, brown rice) for pulao

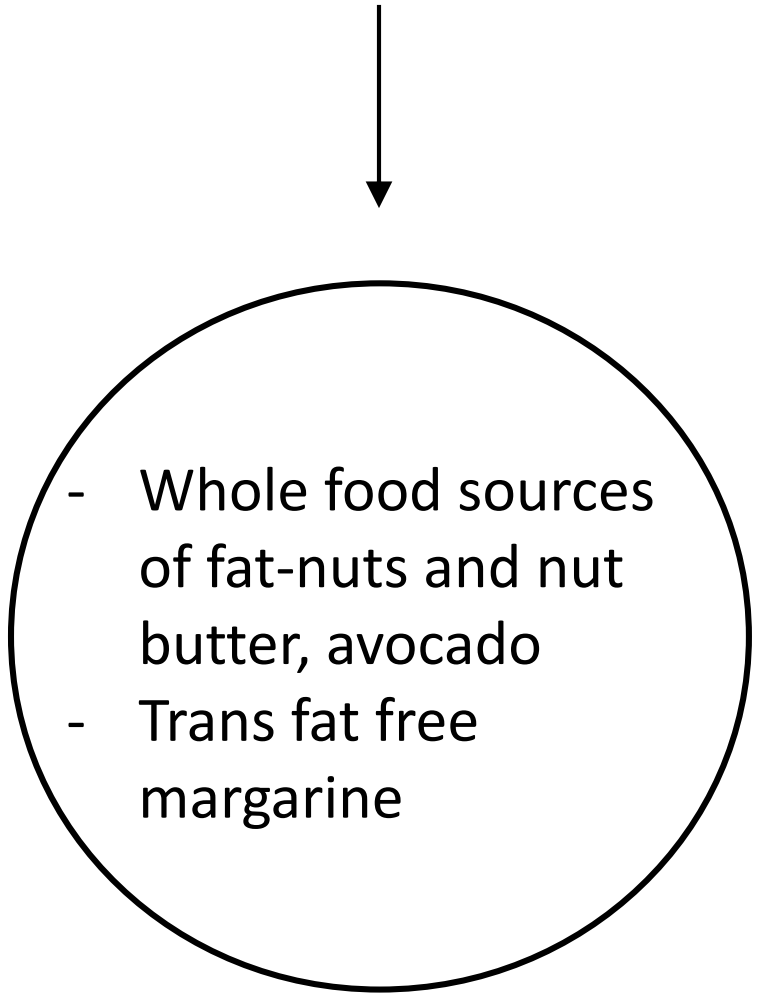
Protein


Encourage
Lentils, dal, chickpeas, yogurt, baked/broiled fish, chicken
Discourage
Red meat, processed meat

Protein

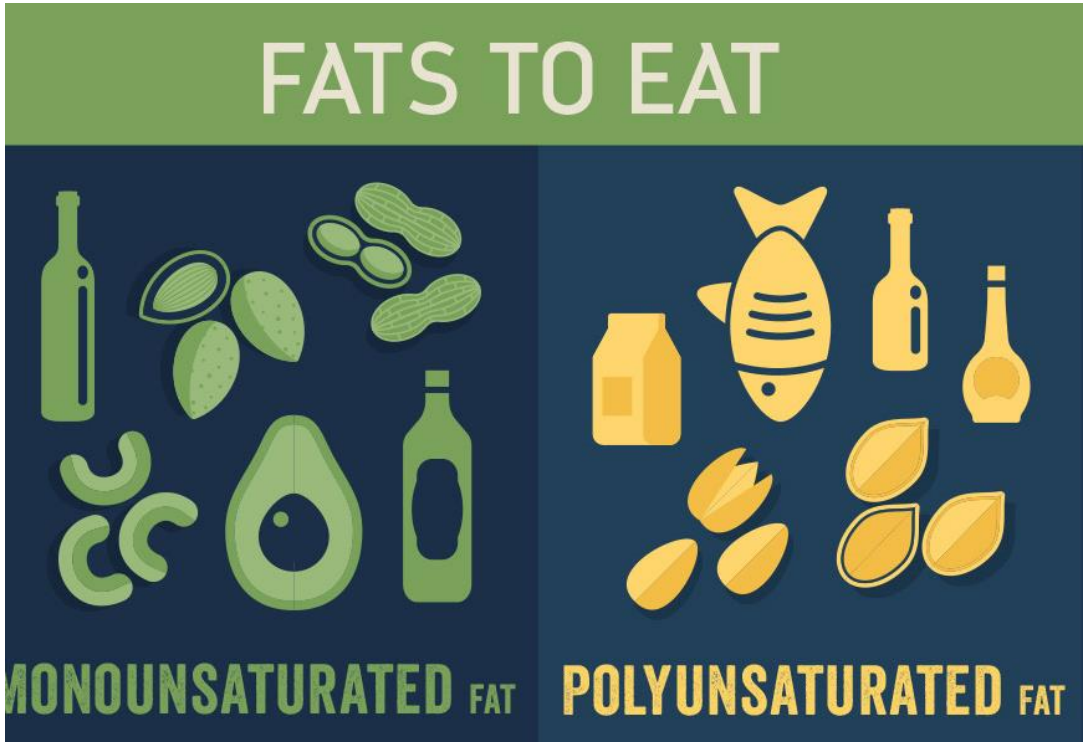
- 2-3 servings of protein foods/day
  - lentils (dhal, dal, daals), dry beans (rajma, channa, soy beans)
    - fibre, protein
  - fish, poultry (chicken/turkey)
  - tofu (use instead of paneer in *palak paneer* or m*atar paneer*
  - One egg + 2 egg whites
- 2-3 servings of dairy
  - milk or buttermilk or yogurt
  - skim milk power for *lassi*
  - Lower fat milk for Indian desserts (*kheer, payassam, paneer, chenna*)

Fat (20-35%)


- Whole food sources of fat-nuts and nut butter, avocado
- Trans fat free margarine

Fats to avoid

- Saturated and *trans* fats
  - Deep frying, ghee
    - "hydrogenated" oils, shortening (Vanaspati) *ghee*
    - Packaged snack foods: *mathri, shaker paras chewda, bhel, sev,* etc.
  - Coconut oil: controversial
    - Raises LDL-C but also raises HDL-C
    - Major source is confectionaries (which are high in refined carbs)



Fats to eat

- Polyunsaturated fats
  - Fish (if religion permits)
    - Salmon (farmed or wild), mackerel, herring, sardines
    - Avoid: swordfish, king mackerel, albacore tuna, shark, tilefish
  - Plants
    - Can get n-3 from canola oil, ground flax seeds, flaxseed oil, English walnuts, Soybean oil, Chia seeds
    - Can get monounsaturated fat from olive oil, canola oil, avocados, olives, nuts, almonds, peanuts, pecans, pistachios, hazelnuts
    - Can get n-6 from corn oil, safflower oil, sunflower
  - Nuts and seeds
    - Flax seeds, English walnuts, chia seeds, peanuts, pecans, pistachios, hazelnuts

7. Make your time count

- Listen
  - Understand where nutrition fits in the patient's health schema
- Encourage small, but reasonable changes
- Build on positive habits
- Avoid scolding, judgemental language
  - Food is a coping mechanism for many people; understand their struggle