

Supplementary Table S2A-J

Diet substitution list

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Supplementary Table S2A: Western^a diet substitution list

Food Item	Replace With
	Any foods that contribute more than 25% of calories or has more than 4 servings, needs to be reduced
Grains	
Needs bread	GF ^b diet substitution average white bread ^c
Needs cereal	GF diet substitution average cereal ^d
Needs crackers	Rice crackers
Needs pasta	Pasta, corn
Needs rice	Brown rice, medium
Needs oats	Rolled oats
White rice	Brown rice, medium or long
Cereal high in sugar	Reduce amount of sugary cereal to half and then add back the same amount of GF diet substitution average cereal
Instant oatmeal	Rolled oats
Tortilla chips, nacho	Tortilla chips, plain or yellow corn
Pancakes	Reduce amount to approximately 2 pieces
Cookies and cakes	Remove
Muffins	Remove, unless total calories do not reach 1600
Tortilla, wrap	Tortilla, corn, ready to bake or fry
Meat	1 fish diet per age group
Needs chicken	Chicken, breast, roast
Needs pork	Pork, tenderloin
Needs beef	Beef, ground crumble, pan fried, extra lean, well done
Chicken (fried, high fat)	Chicken, breast, roast
Chicken (battered, coated)	Chicken, breast, roast
Chicken (leg, dark meat)	Leave, unless total fat % is above AMDR ^e
Pork, high fat	Pork, tenderloin
Bacon	Remove
Back bacon	Remove, unless calories do not reach 1600 and sodium does not reach 1500
Ground pork	Pork, ground, extra lean
Beef, high fat	Beef roast, eye of round, roasted, lean
Ground beef	Beef, ground crumble, pan fried, extra lean, well done
Sausage/pepperoni	50/50 pork and beef ground
Deli ham	Ham, extra lean (5%), sliced
Pork ribs	Reduce amount
Chicken/pork skin	Remove
Needs a meat serving and vitamin D	Use fish, sockeye salmon or whitefish
Meat Alternatives	
Needs egg	Hard boiled eggs
Needs nuts/seeds	Choose from Health Canada Nutrient Value of Some Common Foods ^a , unsalted version
Needs a vegetarian meat option	Tofu (with calcium and magnesium)
Needs beans	Chickpeas/black beans/lentils/green peas, boiled, hummus
Peanut butter, fat & sugar added	Peanut butter, natural
Milk	
Needs milk	Skim
Needs cheese	Mozzarella cheese
Needs yogurt	Yogurt, plain, vitamin D fortified
Milk 1/2/3%	Skim milk
Cream	Remove unless it is less than 0.25 cups
Chocolate/strawberry milk	Skim milk
Condensed milk	Evaporated milk
Milk Shake	Skim milk

Eggnog	Remove
Hot chocolate made with milk	Remove unless it is less than 0.5 cups
Yogurt, flavoured, sweetened	Yogurt, plain, vitamin D fortified
Yogurt, plain	Yogurt, plain, vitamin D fortified
Drinkable yogurt	Yogurt, plain, vitamin D fortified
Danimal/Minigo fresh cheese	Leave as is
Cheese	Reduce amount to less than 50g
Marble cheese	Reduce the cheddar and mozzarella cheese to less than 25g each
Pudding	Remove
Ice cream	Remove
Milk Alternatives	
Needs a non-dairy milk	Soy drink, all flavours, enriched, unsweetened
Rice milk	Leave as is
Coconut milk	Leave as is
Soy milk/beverage	Leave as is
Soy cheese	Reduce amount to less than 50g
Soy/almond/coconut ice cream	Remove
Soy/almond/coconut yogurt	Double check if vitamin D fortified, if not replace with soy milk
Vegetables	
	Choose unsalted version Vegetable must contain one of the following: fresh, boiled, broiled Any vegetable can be selected in the Health Canada Nutrient Value of Common Foods ^a if needed to increase micronutrient levels
Canned vegetables	Fresh equivalent
Frozen vegetables	Leave as is, unless it contributes over 500mg of sodium
Deep fried vegetables	Fresh equivalent
Pickles	Leave as is, unless it contributes over 500mg of sodium
Chips	Remove
Iceberg lettuce	Romaine lettuce, fresh
Hash browns	Potato, baked with skin
French fries	Baked, potato with skin
Needs general vegetables	Choose from Health Canada Nutrient Value of Some Common Foods
Needs vegetables with dip	Carrots/celery/cucumber, fresh, sliced
Needs folate	Fresh spinach/kale (may consider romaine lettuce)
Needs fibre	Green peas, boiled or green beans, boiled
Needs folate and fibre	Edamame, unsalted
Needs calcium	Broccoli, boiled or bok choy, boiled
Needs vegetables without folate	Cabbage, boiled or mushrooms
Fruit	
	Any fruits that are present, do not remove, only add Fruit must have word fresh in its Food Pro entry
Fruit leather	Remove
Jam/fruit compote	Remove, consider it an added sugar other food item
Juice drink	Fresh fruit equivalent
Juice, fruit name	Fresh fruit equivalent
Cranberry juice	Dried cranberries
Needs fruit with more fibre	Pear
Needs fruit, general	Choose from Health Canada Nutrient Value of Some Common Foods ^a
Other Foods: Sugar	
Cookies	Remove, unless total calories are less than 1600
Candies, hard/soft, jellybeans	Remove
Pastries	Remove
Cakes	Remove
Tarts	Remove
Pie	Replace with fresh fruit equivalent
Apple pie	Apple, fresh
Coconut cream pie	Coconut milk
Lemon meringue pie	Remove
Quebec sugar pie	Remove
Fudge, caramel	Remove
Hazelnut/chocolate spread	Remove

Coke, cola, pop	Remove
Diet coke, cola, pop	Leave as it
Hot chocolate	Skim milk
Sugar	Remove, unless less than 1 Tbsp
Honey, molasses	Remove, unless less than 1 Tbsp
Maple syrup	Remove, unless less than 2 Tbsp
Chocolate syrup	Coco powder
Jelly, jam, marmalade	Remove
Whipped cream/cool whip	Remove
Chocolate bar with nuts	Almonds
Ice cream	Remove
Frozen yogurt	Yogurt, with vitamin D
Popsicle, sherbet	Remove, unless total calories less than 1600
Ketchup, barbeque sauce	Reduce to 1 Tbsp max
Juice drink	Orange juice with calcium and vitamin D
Granola	Leave as is, no more than 1 cup per day
Granola bars	Leave as is, no more than 1 per day
Sweet and sour sauce	No more than 0.25 cup per day
Sweet sauces	No more than 0.25 cup per day
Iced tea, sweetened	Tea, brewed
Frappuccino	Remove
Iced cap	Remove, unless broken down to coffee, milk and sugar, then remove sugar component
Vitamin water	Remove, too much sugar and the vitamins & minerals can be replaced with fruits & vegetables
Vitamin water zero	Leave as is
Other Foods: Oils	MUFA <14% ^f PUFA >3% ^g
Needs oil	Canola oil (use safflower oil or corn oil to increase PUFA)
Needs dressing	Homemade oil and vinegar
Mayonnaise	Leave as is, unless more than 1 Tbsp
Olive oil for dipping bread	No more than 2 Tbsp
Salad dressing	Reduce to 1 Tbsp max
Butter	Reduce to 1 tsp max
Mixed Foods	
Lasagna	Leave as is, unless more than 450g, then reduce
Restaurant pizza	Reduce amount to 2-3 slices max
Cream soup	1 cup max
Clear soup	1.5 cup max
Poutine	Reduce amount by 50-25%
Savoury pot pie	Reduce amount to 2-3 slices max
Spices	
Needs salt	Only add if AI ^h is not reached, add salt in 0.125 tsp increments

^a Western diet simulations had all additional food items and substitutions made from Health Canada Nutrient Value of Some Common Foods⁽³⁶⁾

^b GF, gluten free

^c Based on 12 commercially GF breads sold in Canada, represents the average nutrient content

^d Based on 20 commercially GF cereals sold in Canada, represents the average nutrient content

^e AMDR, acceptable macronutrient distribution range

^f MUFA, monounsaturated fatty acids⁽⁴⁷⁾

^g PUFA, polyunsaturated fatty acids⁽⁴⁷⁾

^h AI, adequate intake

Supplementary Table S2B: First Nations, Inuit and Métis^a diet substitution list

Food Item	Replaced With
Grains	
Bread	Bannock
Meat	
Pork, chicken, beef	Moose, deer
Fish	Salmon, whitefish, pike, walleye
Meat Alternatives	Refer to supplementary table S2A
Milk	Refer to supplementary table S2A
Milk Alternatives	Refer to supplementary table S2A
Vegetables	Refer to supplementary table S2A
Fruit	Any fruits that are present do not remove, only add
Needs fruit	Saskatoon berries, blueberries, raspberries

^a First Nations, Inuit and Métis diet simulations followed Eating Well with Canada’s Food Guide - First Nations, Inuit and Métis guidelines⁽⁴⁸⁾

Supplementary Table S2C: East Indian^a diet substitution list

Food Item	Replace With
Grains	
Oats, cereal, pasta	Refer to supplementary table S2A
Bread	GF ^b roti
Rice	Brown, long grain
Rice with beans	Rice & dhal
Cereal	Idli
Meat	Do not add more meat products
Pork	Leave as is, do not add more
Beef	Leave as is
Chicken	Leave as is
Fish	Leave as is
Meat Alternatives	
Eggs, nuts, seeds, etc.	Refer to supplementary table S2A
Beans	Leave as is
Needs beans	Chickpeas, lentils, green peas, fenugreek seeds
Milk	Refer to supplementary table S2A
Cheese	Paneer
Milk Alternatives	Refer to supplementary table S2A
Vegetables	Choose unsalted version
Spinach/kale	Leave as is
Eggplant	Leave as is
Curry	Leave as is
Needs leafy greens	Cooked spinach, mustard leaves, fresh fenugreek seeds, boiled kale, boiled pumpkin leaves, boiled cowpeas leaves, boiled cassava leaves, boiled green sorrel, boiled amaranth leaves, cauliflower, cooked eggplant, boiled potato with skin
Carrots, raw	Boiled carrots, boiled onions, fresh tomatoes, cooked okra
Fruit	Any fruits that are present do not remove, only add
Needs fruit	Banana, papaya, mango, grapefruit, dates, guava, jackfruit, pineapple, sapota (sapodilla), custard apple, fresh coconut
Mixed Foods	
Pizza	Roti plus cheese

^a East Indian diet simulations were designed around the dietary requirements of Hinduism, Christianity and Islamic religions^(49,50)

^b GF, gluten free

Supplementary Table S2D: Somalian^a diet substitution list

Food Item	Replace With
Grains	
Oats, cereal, pasta, crackers	Refer to supplementary table S2A
Bread	Anjero
Corn	Soor
Rice	Iskudahkaris
Rice with beans	Cambulo
Meat	No pork
Pork	Goat, roasted
Beef	Leave as is
Chicken	Leave as is
Fish	Leave as is
Meat Alternatives	
Eggs, nuts, seeds, etc.	Refer to supplementary table S2A
Beans	Leave as is
Needs beans	Lentils
Milk	Refer to supplementary table S2A
Milk Alternatives	Refer to supplementary table S2A
Vegetables	Choose unsalted version
Spinach/kale	Leave as is
Eggplant	Leave as is
Needs leafy greens	Cooked spinach, cooked eggplant
Potatoes, fried/baked	Potato, boiled, with skin
Carrots, raw	Boiled carrots, boiled onions, fresh tomatoes, cooked okra, cooked spinach
Lettuce	Cooked spinach
Fruit	Any fruits that are present do not remove, only add
Fruit juice	Leave as is
Needs fruit	Bananas, papaya, mango, grapefruit
Mixed foods	
Pizza	Anjero plus cheese

^a Somalian diet simulations were created following Islamic dietary laws⁽⁵¹⁾

Supplementary Table S2E: Chinese^a diet substitution list

Food Item	Replaced With
Grains	
Bread, oats	Refer to supplementary table S2A
Rice	Brown rice, medium
Cereal	Congee, brown and white rice
Pasta/noodles	Rice noodles
Meat	
Pork, chicken, beef	Leave as is
Needs folate and meat	Liver, kidney
Meat Alternatives	
Eggs, nuts, seeds, etc.	Refer to supplementary table S2A
Beans	Mung beans
Needs tofu	Tofu
Milk	
Milk	Leave as is
Needs milk	Refer to milk alternative below
Milk Alternatives	
Needs milk	Soy milk, fortified
Vegetables	Choose unsalted version All vegetables must be cooked
Broccoli	Leave as is, if raw select cooked version
Spinach	Leave as is, if raw select cooked version
Needs green vegetables/folate	Cooked Chinese cabbage, cooked Chinese broccoli, cooked eggplant
Potatoes, fried/baked	Potato, boiled with skin
Carrots, raw	Boiled carrots, boiled onions, lotus root
Needs green vegetables/calcium	Bok choy, Japanese mustard spinach
Fruit	Any fruits that are present, do not remove, only add
Fruit juice	Fresh fruit equivalent
Needs fruit	Papaya, mango
Spices/ Seasonings	
Soy sauce	Kikkoman gluten free (1 Tbsp)

^a Chinese diet simulations were designed following the Dietary Guideline for Chinese Residents⁽⁵²⁾

Supplementary Table S2F: Brazilian^a diet substitution list

Food Item	Replaced With
Grains	
White rice	Brown rice (plus 0.5 tsp oil)
Needs grains	Quinoa
Needs grains, corn	Cornmeal, corn- based quinoa
Oats	Leave as is
Needs cereal	Granola, corn flakes, cassava cake with coconut
Tortilla	Tapioca crepe
White bread	Corn bread, gluten free Udi's French bread (bread needs 1 serving of butter/margarine)
Needs crackers	Cassava crackers, oat thin crackers
Meat	
Needs beef	Beef tenderloin, beef rump roast, beef sirloin
Needs pork	Pork ribs, ham
Need chicken	Chicken thighs, chicken drumsticks, chicken heart, egg
Other meats	Lamb
Needs fish	Salted cod (soaked and rinsed), shrimp, steamed crab, steamed mussels, broiled oysters, boiled calamari, tilapia, salmon
Meat Alternatives	
Needs beans/legumes	Peanuts, green peas, fava beans, cowpeas, pinto beans, chickpeas, lentils, tofu, sprouted mung beans, green beans, snow peas
Needs seeds	Flax
Needs nuts	Chestnuts, pine nuts, almonds, hazelnuts, Brazil nuts, cashews, walnuts, pistachios
Milk	
Needs milk	Cow's milk
Needs yogurt	Yogurt, yogurt drink
Needs cheese	Mozzarella, gouda, American processed cheese, Monterey jack cheese, ricotta cheese, parmesan cheese, provolone, blue cheese, cottage cheese
Sour cream	No more than 2 Tbsp
Vegetables	
	Choose unsalted version Diets will have less vegetables than fruit
Potato	Cassava, yams, sweet potato, heart of palm, pumpkin squash, pumpkin, winter melon
Needs vegetables	Cooked mustard greens, cooked watercress, arugula, fennel, chayote, scarlet eggplant, okra, leeks, alfalfa sprouts
Popular vegetables	Carrots, green leaf lettuce, spinach, endive, kale, escarole, cooked collard greens, cooked cabbage, cooked Chinese cabbage, cooked broccoli, cooked zucchini, cooked beets
Fruit	
	Any fruit that are present do not remove, only add Diets will have more fruits than vegetables
Needs fruit	Acai berries, banana, tangerine, pineapple, avocado, persimmon, fig, papaya, mango, passion fruit, watermelon, honeydew melon, custard apple, jackfruit, starfruit, elderberries, soursop, rose apple, strawberry guava, loquat, breadfruit, sapoti/sapodilla, tamarind, lychee, Surinam cherry, pomegranate, kiwi, mulberries, Spondias dulcis, June plum, Byrsonima crassifolia, nance cherries, Malpighia emarginata, Barbados cherry, acerola
Mixed Foods	
Pizza	Reduce to no more than 2 slices
Needs oil	Olive oil
All added oil	Olive oil
Butter	Margarine with vitamin D

^a Brazilian diet simulations were designed following the Brazilian food guide⁽⁵³⁾

Supplementary Table S2G: Iranian^a diet substitution list

Food Item	Replaced With
Grains	
White rice	Brown rice
White bread	Lavash/Sangak, flatbread, Barbari
Pasta	Refer to supplementary table S2A
Oats	Refer to supplementary table S2A
Crackers	Refer to supplementary table S2A
Cereal/breakfast	Refer to supplementary table S2A (do not use as often)
Meat	No pork
Pork	Chicken, beef, lamb, salmon, meat kababs
Meat Alternatives	
Eggs	Baked omelette
Needs meat alternative	Pistachios, walnuts, peanuts, almonds, split peas, chickpeas, cowpeas, kidney beans, lentils, lima beans, pigeon peas, green peas
Milk	Refer to supplementary table S2A
Cheese	Feta, mozzarella
Milk Alternatives	Only use milk alternatives if present in original food record, otherwise do not use
Vegetables	Choose unsalted version
Needs vegetables	Potato, spinach, tomato, cucumber, zucchini, onions, garlic, carrot, coriander, watercress, fenugreek leaves, leeks, lettuce, parsley, red/green peppers, radish, snap beans, eggplant, cabbage, mint, basil, tarragon, Shirazi salad ²
Fruit	Any fruits that are present do not remove, only add
Needs fruit	Grapes, lemons, limes, dates, tamarind, banana, oranges, apple, pomegranates, figs, cherries, apricot, watermelon, cantaloupe, persimmon, mango, muskmelon, olive, plum. Tangerine, mulberry, sour cherry, strawberry, pear
Mixed Foods	
Pizza	Restrict to no more than 2 slices
Spices/Seasonings	
Needs seasoning	Standard stew seasoning

^a Iranian diet simulations were created following Islamic dietary laws⁽⁵¹⁾

Supplementary Table S2H: Lacto-Ovo^a diet substitution list

Food Item	Replace With
Grains	Refer to supplementary table S2A
Meat	Remove all meat products
Needs protein	Refer to meat alternatives below
Meat Alternatives	
Needs egg	Hard boiled eggs
Needs nuts/seeds	Choose from Health Canada Nutrient Value of Some Common Foods ^b , unsalted version
Needs a vegetarian meat option	Tofu with calcium and magnesium
Needs beans	Chickpeas/black beans/lentils/green peas, boiled
Needs beans	Hummus
Peanut butter, fat and sugar added	Peanut butter, natural
Milk	Refer to supplementary table S2A
Milk Alternatives	Refer to supplementary table S2A
Vegetables	Refer to supplementary table S2A
Fruit	Refer to supplementary table S2A
Other Foods	Refer to supplementary table S2A
Mixed Foods	Refer to supplementary table S2A
Spices	Refer to supplementary table S2A

^a Lacto-ovo vegetarian diets consisted of no meat, fish, or poultry but included dairy and eggs⁽⁵⁴⁾

^b Health Canada Nutrient Value of Some Common Foods⁽³⁶⁾

Supplementary Table S2I: Lactose-free^a diet substitution list

Food Item	Replaced With
Grains	Refer to supplementary table S2A
Meat	Refer to supplementary table S2A
Meat Alternatives	Refer to supplementary table S2A
Milk	
Cow's milk	Soy drink/beverage
Cow's milk products	Soy drink/beverage
Milk Alternatives	Refer to supplementary table S2A
Vegetables	Refer to supplementary table S2A
Fruit	Refer to supplementary table S2A
Mixed Foods	
Contains cow's milk/ cow's milk product	Remove/replace with lactose free alternative

^a Lactose-free diets were created by eliminating all cow's milk and products that contain cow's milk⁽⁵⁵⁾

Supplementary Table S2J: Vegan^a diet substitution list

Food Item	Replaced With
Grains	
Bread, cereal, pasta	Vegan alternative
Meat	Remove all meat products
Needs protein	Refer to meat alternatives below
Meat Alternatives	
Needs egg	Hard boiled eggs
Needs nuts/seed	Choose from Health Canada Nutrient Value of Some Common Foods ^b
Needs vegetarian meat option	Tofu with calcium and magnesium
Needs beans	Chickpeas/black beans/lentils/green peas, boiled
Needs beans	Hummus
Peanut butter, fat & sugar	Peanut butter, natural
Milk	
Dairy & dairy products	Remove/replace with alternative (refer to milk alternatives below)
Milk Alternatives	Refer to supplementary table S2A
Vegetables	Refer to supplementary table S2A
Fruit	Refer to supplementary table S2A
Mixed Foods	
Contains dairy/animal products	Remove/replace with vegan alternative

^a Vegan diets excluded all meat, fish, poultry, dairy and eggs⁽⁵⁴⁾

^b Health Canada Nutrient Value of Some Common Foods⁽³⁶⁾