

Table 1. Study Group

Sex	Male
Age	45
Weight (kg)	70
Height (m)	1.77
PA Value	1
Calories intake per day	2301.942

Table 3. Calories Exchange Table

	<i>kcal/ gram</i>
Sugar	4
Carbohydrates	4
Protein	4
Fat	9
Saturated Fat	9

Table 2. Daily Intake Recommendations

<i>Recommendations</i>	<i>Lower bound</i>	<i>Upper bound</i>
Calories intake (kcal)	2201.942	2301.942
Fibers (g)	30	50
Soluble Fibers	1/3 of Fibers	
Total Water (Litres)	3.7	4
Fats (g)	51.154267	89.519967
Saturated Fat (g)	17.903993	23.01942
Carbohydrates (g)		149.62623
Proteins (g)	56	105
Sugar (g)		28.774275
Sodium (mg)	1500	2300
Calcium (mg)	800	2500
Iron (mg)	6	45
Potassium (mg)	3500	4700
Vitamin A (µg)	625	3000
Vitamin C (mg)	75	2000
Vitamin D (µg)	10	100
Vitamin B6 (mg)	1.4	100
Vitamin B12 (µg)	2	1000
Vitamin E (mg)	12	1000

*Grayed out variables will be excluded from the model mostly due to not having available data.

Table 4. Data on Food Prices and Nutritional Values

*Data was collected as of March 16, 2023

*All prices were collected from Walmart.ca

*All nutrition facts were collected from Walmart.ca & Nutritionix.com

		Prices	Nuitrion Facts	Calories(kcal)	Fat(g)	Saturated Fat(g)	Sodium(mg)	Carbohydrates(g)	Fiber(g)	Sugar(g)	Protien(g)	Vitamin A(μg)	Vitamin C(mg)	Vitamin D(μg)	Calcium(mg)	Potassium(mg)	Iron(mg)	Vitamin B6(mg)	Vitamin B12(μg)	Vitamin E(mg)
Fruits	Apple	\$5.45/kg	per piece (182 g)	95	0.3	0.1	1.8	25	4.4	19	0.5	-	-	0	11	194.7	0.2	-	-	-
	Banana	\$1.72/kg	per piece (118 g)	105	0.4	0.1	1.2	27	3.1	14	1.3	-	-	0	5.9	422.4	0.3	-	-	-
	Melon	\$5.97/melon	per piece	461	1.8	0.5	230	116	10	104	6.9	-	-	0	77	2918.4	2.2	-	-	-
	Mango	\$.87/mango	per piece	202	1.3	0.3	3.4	50	5.4	46	2.8	-	-	0	37	564.5	0.5	-	-	-
Dairy	Milk	1.45/L	per (1/4) 250 ml	90	0	0	125	13	0	13	9	90	0	8	375	-	0	-	-	-
	Yogurt	\$7.28/pack of 16	per piece (100 g)	40	0	0	60	6	0	4	4	50	-	1	125	175	0.1	-	-	-
	Cheese	\$4.79/pack 750 g	per 125 g	100	2.5	1.5	290	7	0	7	14	18	0	-	187.5	-	0.2	-	-	-
Carbs.	Bread	3.97/pack 600 g	per 2 slices 75 g	190	3.5	0.5	270	33	4	3	8	-	-	-	75	200	2	-	-	-
	Rice	\$2.37/kg	per 45g	160	0	0	0	37	0	0	3	0	-	0	0	-	0	-	-	-
	Potatoes	\$1.99/kg	per 100 g	93	0.1	0	10	21	2.2	1.2	2.5	0	-	0	15	535	1.1	-	-	-
Protein	Chicken	\$15.48/chicken 1.5 kg	per 1/5 (300g) of chicken	714	40	11	240	0	0	0	81	-	-	0	45	666	3.5	-	-	-
	Fish	\$6.97/pack 908 g	per 125g of pack	90	2	1	240	0	0	0	17	0	2	-	0	-	0	-	-	-
	Tofu	\$2.47/pack 454 g	per 1/5 (85 g) of pack	70	4	0.5	3	2	0	0	7	-	-	-	125	175	1	-	-	-
	Egg	\$9.18/pack of 30	per egg	70	5	1.5	65	1	0	0	6	100	-	-	25	-	1	-	-	-
Vegetables	Avocado	5.97/pack of 5	per avocado	322	29	4.3	14	17	13	1.3	4	-	-	0	24	974.9	1.1	-	-	-
	Beans	8.80/kg	per 100 g	35	0.3	0.1	1.3	7.9	3.2	3.6	1.9	-	-	0	44	146	0.7	-	-	-
	Carrots	\$2.10/kg	per 100 g	35	0.2	0	58	8.2	3	3.5	0.8	-	-	0	30	235	0.3	-	-	-
	Broccoli	\$8.80/kg	per 100 g	35	0.4	0.1	41	7.2	3.3	1.4	2.4	-	-	0	40	293	0.7	-	-	-
Free Foods	Tea	9.97/pack of 216	per tea bag	0	0	0	0	1	0	0	0.1	-	-	-	-	-	-	-	-	-
	Chips	\$1.48/pack 200g	per 1/4 (50 g) of pack	280	19	1.5	290	26	2	0	3	-	-	-	10	600	0.75	-	-	-
	Pretzels	\$2.97/pack 400g	per 1/8 (50 g) of pack	200	1	0	700	42	2	1	5	0	0	-	25	-	2	-	-	-

Decisions

<i>Time (days)</i>	7
<i>Number of Meals/day</i>	3
<i>Current Number of Food Items</i>	21
<i>Number of Decision Variables (Binary)</i>	<hr/> 441

Objective

Minimize Total Cost of One-week Meal Plan

Constraints

<i>Number of Nutrition Adequacy (GT) Constraint</i>	14
<i>Number of Dietary Restriction (LT) Constraint</i>	14
<i>Meal Variety Constraint</i>	-

Model Type

Binary Linear Program