

**Table 1. Study Group**

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

**Table 2. Calories Exchange Table**

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

**Table 3. Daily Intake Recommendations**

<i>Recommendations</i>	<i>Lower bound</i>	<i>Upper bound</i>
<b>Calories intake (kcal)</b>	1801.942	2301.942
<b>Fibers (g)</b>	30	50
<b>Fats (g)</b>	51.154267	89.519967
<b>Saturated Fat (g)</b>	17.903993	23.01942
<b>Carbohydrates (g)</b>		149.62623
<b>Proteins (g)</b>	56	105
<b>Sugar (g)</b>		28.774275
<b>Sodium (mg)</b>	1500	2300
<b>Calcium (mg)</b>	800	2500
<b>Iron (mg)</b>	6	45
<b>Potassium (mg)</b>	3500	4700
<b>Vitamin A (µg)</b>	625	3000
<b>Vitamin D (µg)</b>	10	100

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	Price Proportions	Prices per Portion	Nutrition Facts	Nutrition Proportions	Calories(kcal)	Fat(g)	Saturated Fat(g)	Sodium(mg)	Carbohydrates(g)	Fiber(g)	Sugar(g)	Protien(g)	Vitamin A(µg)	Vitamin D(µg)	Calcium(mg)	Potassium(mg)	Iron(mg)
Fruits	Apple	\$5.45/kg	5.5	\$0.99	per piece (182 g)	1.0	95	0.3	0.1	1.8	25	4.4	19	0.5	0	0	11	194.7	0.2
	Banana	\$1.72/kg	8.5	\$0.20	per piece (118 g)	1.0	105	0.4	0.1	1.2	27	3.1	14	1.3	0	0	5.9	422.4	0.3
	Melon	\$5.97/melon	8.0	\$0.75	per piece	8.0	57.625	0.225	0.0625	28.75	14.5	1.25	13	0.8625	0	0	9.625	364.8	0.275
	Mango	\$.87/mango	2.0	\$0.44	per piece	2.0	101	0.65	0.15	1.7	25	2.7	23	1.4	0	0	18.5	282.25	0.25
Dairy	Milk	1.45/L	4.0	\$0.36	per (1/4) 250 ml	1.0	90	0	0	125	13	0	13	9	90	8	375	0	0
	Yogurt	\$7.28/pack of 16	16.0	\$0.46	per piece (100 g)	1.0	40	0	0	60	6	0	4	4	50	1	125	175	0.1
	Cheese	\$4.79/pack 750 g	10.0	\$0.48	per 125 g	1.7	60	1.5	0.9	174	4.2	0	4.2	8.4	10.8	0	112.5	0	0.12
Carbs.	Bread	3.97/pack 600 g	8.0	\$0.50	per 2 slices 75 g	1.0	190	3.5	0.5	270	33	4	3	8	0	0	75	200	2
	Rice	\$2.37/kg	22.2	\$0.11	per 45g	1.0	160	0	0	0	37	0	0	3	0	0	0	0	0
	Potatoes	\$1.99/kg	20.0	\$0.10	per 100 g	2.0	46.5	0.05	0	5	10.5	1.1	0.6	1.25	0	0	7.5	267.5	0.55
Protein	Chicken	\$15.48/chicken 1.5 kg	10.0	\$1.54	per chicken (1509 g)	10.0	321.4	23.3	6.7	104.1	0.14	0	0	25.8	0	0	15.1	295.76	2.1
	Fish	\$6.97/pack 908 g	7.3	\$0.96	per 125g of pack	1.0	90	2	1	240	0	0	0	17	0	0	0	0	0
	Tofu	\$2.47/pack 454 g	5.3	\$0.46	per 1/5 (85 g) of pack	1.0	70	4	0.5	3	2	0	0	7	0	0	125	175	1
	Egg	\$9.18/pack of 30	30.0	\$0.31	per egg	1.0	70	5	1.5	65	1	0	0	6	100	0	25	0	1
	Pork	\$10.96/kg	10.0	\$1.10	per 100 g	1.0	238	14	4.9	57	0	0	0	26	0	1	20	341	1.1
	Shrimp	\$12.47/pack 600g	7.1	\$1.77	per 125g of pack	1.5	54.4	0.34	0.136	462.4	0	0	0	12.24	0	0	27.2	102	0.204
	Beef	\$19.78/kg	10.0	\$1.98	per 100 g	1.0	259	17	6.8	50	0	0	0	26	0	0.3	13	271	2.2
Vegetables	Avocado	5.97/pack of 5	10.0	\$0.60	per avocado	2.0	161	14.5	2.15	7	8.5	6.5	0.65	2	0	0	12	487.45	0.55
	Beans	8.80/kg	10.0	\$0.88	per 100 g	1.0	35	0.3	0.1	1.3	7.9	3.2	3.6	1.9	0	0	44	146	0.7
	Carrots	\$2.10/kg	10.0	\$0.21	per 100 g	1.0	35	0.2	0	58	8.2	3	3.5	0.8	0	0	30	235	0.3
	Broccoli	\$8.80/kg	10.0	\$0.88	per 100 g	1.0	35	0.4	0.1	41	7.2	3.3	1.4	2.4	0	0	40	293	0.7
Free Foods	Tea	9.97/pack of 216	216.0	\$0.05	per tea bag	1.0	0	0	0	0	1	0	0	0.1	0	0	0	0	0
	Chips	\$1.48/pack 200g	4.0	\$0.37	per 1/4 (50 g) of pack	1.0	280	19	1.5	290	26	2	0	3	0	0	10	600	0.75
	Pretzels	\$2.97/pack 400g	8.0	\$0.37	per 1/8 (50 g) of pack	1.0	200	1	0	700	42	2	1	5	0	0	25	0	2
	Bacon	\$5.97/pack 375g	5.5	\$1.08	per 2 sclices 68g	1.0	290	29	11	480	40	0	0	7	0	0	0	100	0.2

Decisions

		Breakfast	Lunch	Dinner
Fruits	Apple	0	0	0
	Banana	0	0	1
	Melon	1	0	0
	Mango	1	0	0
Dairy	Milk	0	1	0
	Yogurt	1	0	0
	Cheese	0	0	0
Carbs.	Bread	0	0	1
	Rice	0	0	0
	Potatoes	1	0	0
Protein	Chicken	0	0	0
	Fish	0	0	0
	Tofu	0	1	0
	Egg	0	0	0
	Pork	1	0	0
	Shrimp	0	0	0
Vegetables	Beef	0	0	0
	Avocado	0	1	0
	Beans	0	0	0
	Carrots	1	0	0
Free Foods	Broccoli	0	0	0
	Tea	0	0	0
	Chips	0	0	1
	Pretzels	0	0	1
	Bacon	0	0	0

Objective

Cost per Meal	3.04175	1.421945	1.44046
Total Cost	5.904155		

Constraints (Set 1)

		LHS			
Lower Bounds	Calories (LB)	518.125	321	775	1614.125
	Fat (LB)	15.125	18.5	23.9	57.525
	Saturated Fat (LB)	5.1125	2.65	2.1	9.8625
	Sodium (LB)	210.45	135	1261.2	1606.65
	Carbohydrates (LB)	64.2	23.5	128	215.7
	Fiber (LB)	8.05	6.5	11.1	25.65
	Sugar (LB)	44.1	13.65	18	75.75
	Protein (LB)	34.3125	18	17.3	69.6125
	Vit A (LB)	50	90	0	140
	Vit D (LB)	2	8	0	10
	Calcium (LB)	210.625	512	115.9	838.525
	Potassium (LB)	1665.55	662.45	1222.4	3550.4
	Iron (LB)	2.575	1.55	5.05	9.175
Upper Bounds	Calories (UB)	518.125	321	775	1614.125
	Fat (UB)	15.125	18.5	23.9	57.525
	Saturated Fat (UB)	5.1125	2.65	2.1	9.8625
	Sodium (UB)	210.45	135	1261.2	1606.65
	Carbohydrates (UB)	64.2	23.5	128	215.7
	Fiber (UB)	8.05	6.5	11.1	25.65
	Sugar (UB)	44.1	13.65	18	75.75
	Protein (UB)	34.3125	18	17.3	69.6125
	Vit A (UB)	50	90	0	140
	Vit D (UB)	2	8	0	10
	Calcium (UB)	210.625	512	115.9	838.525
	Potassium (UB)	1665.55	662.45	1222.4	3550.4
	Iron (UB)	2.575	1.55	5.05	9.175

Constarints (Set 2)

		LHS		RHS	In Use
Variety	Apple	0	<=	1801.942	
	Banana	1	<=	51.154267	
	Melon	1	<=	17.903993	
	Mango	1	<=	1500	
	Milk	1	<=	0	
	Yogurt	1	<=	30	
	Cheese	0	<=	0	
	Bread	1	<=	56	
	Rice	0	<=	625	
	Potatoes	1	<=	10	
	Chicken	0	<=	800	
	Fish	0	<=	3500	
	Tofu	1	<=	6	
	Egg	0	<=	2301.942	
	Pork	1	<=	89.519967	
	Shrimp	0	<=	23.01942	
	Beef	0	<=	2300	
	Avocado	1	<=	149.62623	
	Beans	0	<=	50	
	Carrots	1	<=	28.774275	
	Broccoli	0	<=	105	
	Tea	0	<=	3000	
	Chips	1	<=	100	
	Pretzels	1	<=	2500	
	Bacon	0	<=	4700	
	Fruits	3	>=	45	
	Dairy	2	>=		
	Carbs.	2	>=		
	Protein	2	>=		
	Vegetables	2	>=		
Free Foods	Free Foods	2	>=		
	Breakfast (LB)	6	>=		
	Lunch (LB)	3	>=		
	Dinner (LB)	4	>=		
	Breakfast (UB)	6	<=		
	Lunch (UB)	3	<=		
	Dinner (UB)	4	<=		