

§6.9: DUALITY AND SENSITIVITY ANALYSIS FOR OBJECTIVE FUNCTION COEFFICIENTS AND NEW ACTIVITIES

- 1.] SugarCo manufactures three types of candy bar: Whatchamacallit, Peanut Chews, and Abba-Zabba. Each bar consists totally of sugar and chocolate. The compositions of each type of candy bar and the profit earned from each candy bar are in the table below. Fifty oz of sugar and 100 oz of chocolate are available. To maximize profits, SugarCo formulates the following LP:

	Sugar	Chocolate	Profit	
Candy Bar	(ounces)	(ounces)	(cents)	
Whatchamacallit	1	2	3	Maximize: $z = 3x_1 + 7x_2 + 5x_3$
Peanut Chews	1	3	7	Subject to: $x_1 + x_2 + x_3 \leq 50$
Abba-Zabba	1	1	5	$2x_1 + 3x_2 + x_3 \leq 100$ $x_1, x_2, x_3 \geq 0$

The optimal tableau is

Row	Basic	z	x_1	x_2	x_3	s_1	s_2	RHS
0	z	1	3	0	0	4	1	300
1	x_3	0	$\frac{1}{2}$	0	1	$\frac{3}{2}$	$-\frac{1}{2}$	25
2	x_2	0	$\frac{1}{2}$	1	0	$-\frac{1}{2}$	$\frac{1}{2}$	25

- a.) For what values of profit on the Whatchamacallit does the current basis remain optimal?
- b.) If a Whatchamacallit used 0.5 oz of sugar and 0.75 oz of chocolate, would the current basis remain optimal?

- c.) SugarCo is considering making an Idaho Spud that yields \$0.10 profit and uses 2 oz of sugar and 1 oz of chocolate. Does the current basis remain optimal?