Rolls Bakery Linear Programming Model

Decision Variables:

1) X: # DRC lots produced
2) Y: # SRC lots produced

Objective Function:

Maximize Net Profit = $400 per lot * X lots + $300 per lot * Y lots

s. t.

Processing Time: 10 hr/lot * X lots + 15 hr / lot * Y lots ≤ 150 hrs

Contractual Agreement for Minimum Production of DRC: X ≥ 3

Contractual Agreement for Minimum Production of SRC: X ≥ 4

X, Y ≥ 0

Note: You do not have to write the units everytime (if it gets messy), I include them here for extra clarification.

Microsoft Excel 16.0 Sensitivity Report
Worksheet: [Ch2_RollsBakery - Recorded.xlsx]Rolls Bakery
Report Created: 05/02/2022 19:51:14

Variable Cells

Cell	Name	Final Value	Reduced Cost	Objective Coefficient	Allowable Increase	Allowable Decrease
B8	DRC Lots Number of Lots per Week	9	0	400	1E+30	200
B9	SRC Lots Number of Lots per Week	4	0	300	300	1E+30

Constraints

Cell	Name	Final Value	Shadow Price	Constraint R.H. Side	Allowable Increase	Allowable Decrease
B15	Processing Time Usage /Outcome	150	40	150	1E+30	60
B16	Demand for DRC Lots Usage /Outcome	9	0	3	6	1E+30
B17	Demand for SRC Lots Usage /Outcome	4	-300	4	4	4

Given the Rolls Bakery problem and screenshot of the Sensitivity Report, which of these statements would be incorrect?

a) If some of the retailers push for a contract renewal which requires producing at least 5 lots of SRC, the bakery should ask for more than $300 of increase in total weekly payments from these retailers.

b) Suppose that one of the machines breaks down, and available machine hours drop down to 80 hours that week. Then, the loss of net profit for the bakery is 70 hrs * $40 per hr = $2800.

c) The bakery would be better of having another bakery produce the SRC and selling it to them for $300 per lot.

d) If SRC requirement is increased to 8 lots per week, the bakery would be producing only 3 lots of DRC per week.