Workshop Report 1

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1. The Model without the option of additional A tomatoes

The company needs to produce 700,000 pounds of Whole Tomato, 300,000 pounds of Tomato Juice and 2,000,000 pounds of Tomato Paste. The total contribution would be $676,067 and total profit would be $136,067.

We can be sure that our recommendation is the best possible one since all available tomatoes have been used and each of the final product's quality satisfies the requirements. If we increase the production of one product by decreasing the production of another product, the total contribution would decrease.

2. Additional supply of A tomatoes

Yes, Gordon should buy the additional A tomatoes. He should allocate the additional A tomatoes to Whole Tomato.

The company needs to produce 820,000 pounds of Whole Tomato, 260,000 pounds of Tomato Juice and 2,000,000 pounds of Tomato Paste. The total contribution would be $697,747 and total profit would be $137,347.

There is only one optimal allocation, since all resources have been used and all requirements are satisfied. Most variables have their allowable increase or decrease as zero, so if we change their value a bit we will not obtain profit as high as original solution.

If the additional A tomatoes have higher cost, based on the sensitivity report, Gordon would be willing to pay up to 27.1 cents/pound for them.

3. Advertising

The company needs to produce 883,000 pounds of Whole Tomato, 73,000 pounds of Tomato Juice and 2,125,000 pounds of Tomato Paste. The total contribution would be $703,788 and total profit would be $143,388.

Since the total profit increase from the last scenario is $6,041, RBC should be willing to pay such for a campaign. There is no profit increase if the demand of whole tomato or tomato juice is increased so advertising should be directed at tomato paste.

Based on Sensitivity Analysis, the shadow price of a campaign or not is $6041, which means carrying out one campaign has the benefit of $6041, which will be the max RBC should be willing to pay.

4. Additional supply of B tomatoes

I don't think his reasoning is valid. As long as additional B tomatoes could produce a contribution larger than 18 cents per pound, we could definitely use more B tomatoes.

I wouldn't buy additional B tomatoes at 18 cents per pound since the shadow price of B tomatoes is 17.37 cents per pound which is lower than the price available. We won't make additional profits with these B tomatoes.

5. One year later

I would advise RBC to buy 13 million pounds for a sunny year. For a normal year, I would advise to buy 8 million pounds and for a poor year, I would advise to buy 2.727 million pounds.

If I order S pounds of tomatoes, the possible outcomes would be $513,533 profit for the sunny year, $97,556 profit for the normal year and $1,185,111 loss for the poor year.

If I order N pounds of tomatoes, the possible outcomes would be $333,867 profit for the sunny year, $275,333 profit for the normal year and $514,000 loss for the poor year.

If I order P pounds of tomatoes, the possible outcomes would be $113,818 profit for the sunny year, $104,848 profit for the normal year and $77,939 profit for the poor year.

The average result of ordering S tomatoes would be loss of $119,116.67, the average result of ordering N tomatoes would be profit of $92,633,33, and the average result of ordering P tomatoes would be profit of $100,363.64.

Thus, I would advise RBC to buy 2.727 million pounds of potatoes.