Case Study:
Sunsoak Products

Sunsoak Products is a relatively new contender in the skin care market. Its primary focus is on products for protection against potential dangers of exposure to sun. Its general advertising theme has been successful; a substantial number of people "Don't soak the sun without Sunsoak." The success of the product line has caused capacity problems in its manufacturing operations. Although raising prices is often one approach to rationing scarce capacity, retail commitments make it inappropriate for Sunsoak to change its prices. Sunsoak must decide how to use its scarce manufacturing capacity and imported oil in a fashion that is as profitable as possible.

The production operations for Sunsoak are relatively simple; an imported oil is the primary ingredient of each product. For the near tern, oil is arriving from the supplier at the rate of 300 liters per day. Although Sunsoak has made inquiries, there seems to be no way to change this rate in time to affect the current planning period. Each retail container of the product labeled *screen* requires 140 milliliters (ml) of oil. As there are 1000 ml of oil in a liter, slightly more than seven containers of *screen* can be made from each liter of oil. There other two products do not use as much oil. The *block* product requires 85 ml per container; and *soak* requires 130 ml. Although there are other ingredients in each of the products, their availability is essentially unlimited; the cost of these ingredients is inconsequential to Sunsoak's planning.

The manufacturing operations for the three products, *screen*, *block*, and *soak* are described in this report from the manager:

The first product, *screen*, requires time in our mixing machine. When we are mixing *screen*, we turn out enough mixture for six containers each minute, or 360 each hour. That means each container requires ten seconds. The mixture goes to the filling machine, where it is place into containers. This product has the largest containers, and its viscosity makes it a slower job the get into the containers. We can do only four containers a minute, or 240 each hour. Another way of stating this is that each container requires fifteen seconds for filling. The packaging for *screen*, like all products in this line, is a plastic container mounted on cardboard, which is then placed in "blister pack" so it can be hung on display racks that are on countertops in stores. The container is large, but the profile is simple; the operation that turns out the "blister pack" is pretty good for this product. We can do four a minute, or 240 each hour; this is equivalent to fifteen seconds per container. The operations are quite smooth when we are working on *screen*, because the mixing and blistering are son nicely balanced.

The second product in the line, *block*, goes through the same three processes; mixing, filling, and blister-packaging. A variety of ingredients is used in *block*, so it takes longer to mix this product. A recent study of the mixing operation indicated that a typical mixing operation for *block* is sufficient for fifty containers; this mixing required fifteen minutes. On the average, we mix enough for one container every eighteen seconds. The filling operation requires only eight seconds per container. The odd shape of the product makes the blister-packaging time consuming; on the average, twenty-two seconds are required to package one container.

The third product, *soak*, can be mixed at an average time of nine seconds per container. Filling a container requires twelve seconds. It can be blister-packaged in eighteen seconds.

A quick phone call provided information about the cost and availability of the machines necessary for each of the three operations. The plant had recently switched to a new work schedule, with each person working four shifts each week; each shift is ten hours long. The mixing and filling operations can be run only one shift each day for these products, because it is used for other products during the other hours of the day. The blister-packaging can be run two shifts each day, because no other parts of the company utilize this equipment. The cost of operating the mixing operation is $45 per hour which includes operators, supervision, and estimated maintenance. The filling operation costs $50 per hour; the blister-packaging operation costs $55 per hour.

The marketing campaign for these products is based upon Sunsoak selling at fixed (but perhaps high) prices. The company receives $8.00 for each container of *screen*, $10.00 for each container of *block*, and $12.00 for each container of *soak*.

Case Assignments

1. Develop an influence chart for Sunsoak Products. This influence chart is to show the logic to calculate (for one product) the information that management wants in order to evaluate a production plan. This information includes:

What is the daily profit for the product?
How many hours of mixing are required each day?
How many hours of filling are required each day?
How many hours of blister-packaging are required each day?

2. Construct a spreadsheet model from the influence cart. Use the model to evaluate the proposed production plan to produce 800 containers of *screen*, 1000 containers of ***block,*** and 1200 containers of *soak* each day.

3. Discuss the proposed production plan in terms of resources available and n terms of profit. Compare the proposed production plan with each of these alternative plans.

Plan A: 500 containers of each product.
Plan B: 1000 conatiners of each product.
Plan C: 1500 containers of each product.

4. Can you find a production plan that is better than any of those proposed? In what ways do you use the model in searching for a better plan?

Source: Donald Plane, Management Science, Boyd & Fraser, 1996, pp. 23-24.