



Client Case Study "Give Me One Banana"

Background

The client was a large U.S. company, a leading supplier of bananas to the world market. The company contacted GEN3 with the following request: **"We have been in business for over one hundred years. We need to shake up our markets with new innovation."**

GEN3 responded to this request with a revolutionary idea: create a new product — **an individual banana** — and bring it to the market **within the Snack Foods industry**.

The client clearly had considered this idea before, but to move forward it would be necessary to solve several difficult engineering problems for which they did not have solutions, namely:

- develop new equipment for separating banana clusters into individual bananas;
- create packaging for an individual banana;
- and learn how to control the ripening process of a banana after harvesting so it gets to the consumer at the just the right moment with the best flavor, appearance, and texture.

Separating Clusters into Individual Bananas

During the first stage of the project it was necessary to develop a **device which could separate banana clusters into individual bananas**, with the following two constraints:

- the banana flesh could not be damaged; and
- neat stalks of equal length must be left on all bananas after cutting.

This task was complicated by the facts that:

- banana clusters vary in terms of the number, shape and length of their bananas; and
- clustered bananas typically grow in the form of two sub-clusters — internal and external.

After studying the contents of several dozen of boxes of bananas, GEN3 discovered that the bending radius of the upper part of the cluster (that portion which is supposed to be cut off) is approximately the same for all clusters. This generated an idea which proved critical to the solution — designing the cutting blade intended for



this operation as a cylindrical section with a radius of curvature that was the same as the average bending radius of the banana clusters.

The next problem to be solved was how to transport banana clusters to the blade. A special approach was developed which involved suspending banana clusters on a string with special nodes that seized each next cluster and delivered it to the blade.

As frequently happens during the creation of an experimental prototype, two new engineering problems emerged and were quickly resolved. The solutions required development of a technique to maintain the distance between a banana cluster and the cutting edge of the blade and a mechanism which could both turn a banana cluster to the right position for separating individual bananas from the cluster (regardless of whether the bananas were in the external or internal layers of the cluster) and would yield stalks of equal length. This industrial prototype was delivered to the client and notably was a very simple mechanical design. Figure 1 shows the size of the unit.

Our client elected to move forward with the marketing concept, and initially deployed the idea of an individual banana using alternate (but more expensive) technology supplied by GEN3 for controlling ripening at the point of sale. This alternative also precludes the use of individual packaging as described above. Within the snack foods and light meals segment of the market (i.e., among sandwiches, yoghurts, ice-cream, cookies, etc.), this natural and high-energy product has proven to be very competitive. An individual banana, sold in outlets such as coffeehouses, bars and movie theaters, competes favorably with nuts and popcorn and, at a per-banana price point that is 10X what can be obtained when selling bananas in clusters. With such margins, this new product dramatically increased revenues and met the challenge to "shake things up."