

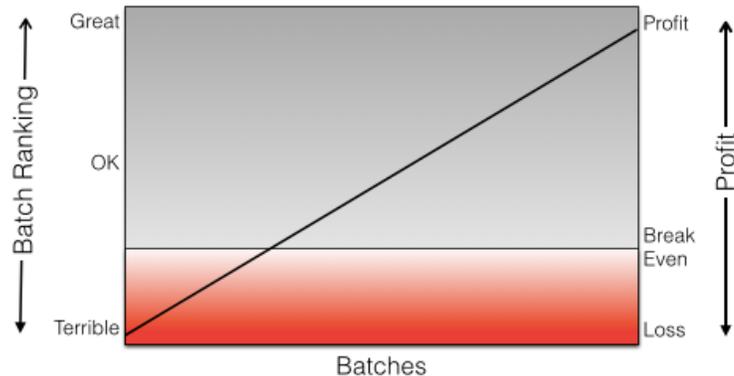
Great Batch, Every Batch

By Olin Thompson

Some batches are great and some are terrible. To improve performance, we need to ask “why are some great and some terrible?” Knowing the answer to that question can mean no more terrible batches, many more great ones, and making more money.

What Makes A Batch Great or Terrible?

The definition of a “great batch” or a “terrible batch” will vary from business to business or even product to product. The results can vary by plant, production line, individual product and by components (materials consumed in production), and even the personnel involved. Production and quality measure the results by yield, costs, defect rates, by sensory satisfaction, by cost, and by quality produced. In all cases, the definition is eventually distilled to how well an individual batch contributes to profitability.

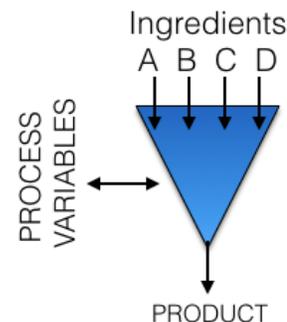


If we rank all batches from the best to the worse, we see a small percentage at the top that are great and a small percentage at the bottom which are terrible. If we also plot the batch P&L or contribution for each batch, we get a strong correlation between contribution and the ranking of the batches.

How to Improve

What causes great versus terrible batches? Experienced plant people give us some insight, as their experience reveals a correlation between what goes into the batch and what comes out. They understand cause and effect. They understand the relationship between individual ingredient characteristics and process variables and their effects on production results.

To understand the relationship between these variables and batch quality, we need to look at a series of batches, tracking and comparing the data from each batch. If we could understand the correlation between batch ranking and these variables, we could identify the conditions that produce a desirable (or undesirable) outcome. We could stop making terrible batches and make more great batches and improve many of the batches in-between. This results in both better financial performance and customer satisfaction.



Many variables go into determining the ranking of the batch. If we look at the production process as a black box, we can see a series of ingredient inputs (A, B, C, D, etc.), each with a set of quality parameters. We also see a series of process variables (temperature, pressure, etc.) that can impact the ranking of the batch. Using these variables, we employ statistical methods, to understand cause and effect and therefore, the conditions that deliver the “golden batch”. We need to continuously monitor the results of our production to catch inconsistencies from our plants and suppliers.

To complicate the situation, but to drive more performance predictability, we need to acknowledge that ingredients or components have their own material variabilities. Therefore, they also need constant monitoring before production can stabilize its process variables.

For continuous improvement, we need to manage each of these variables. The more information we have, the better our analysis will be. If the finished product depends on the performance of our supplier’s suppliers, we must constantly gather and leverage this information as well.

Collect, Analyze and Monitor

We face several challenges in collecting, analyzing and monitoring. First, how do we collect the information? The information on individual ingredient lots and end-products are typically available, but not in a format that we can use. Ingredient parameters may come from the suppliers Certificate of Analysis (COA), our own test labs or outside testing facilities. This data has been captured, but not for our purposes. Process parameters may be available from data historians, MES or other control systems. Finally, finished product results come from testing.

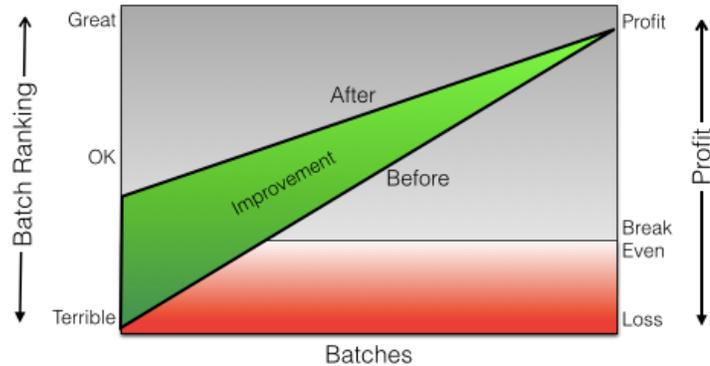
In order to improve, this information has to be made available for our analyses. The more data we have, the better the results. However, even limited data may help us to improve.

Second, we need to analyze the information and look for the correlations between the input parameters and batch ranking. Various statistical processes yield information that shows us the common elements that drive quality levels and improve profit potential.

Our analysis may reveal that some variables actually have limited impact. For these non-impacting variables, we may be able to move to a lower quality ingredient to either reduce cost or change the range of acceptability. We may find a direct correlation between ingredient quality and batch quality. For these, we may want to minimize the range of acceptable ingredient quality to close in on more perfect batches.

Third, we need to monitor the critical parameters to insure that our changes result in on-going improvements. Using these parameters, our monitoring activities help us eliminate terrible batches, produce more great batches and improve most if not all batches. Monitoring incoming ingredients will help us understand how to better utilize specific lots for use with

specific products. It can help us select ingredient lots that will result in a great batch instead of leaving it to chance. We can use the information to work with vendors to help them improve their performance and therefore, our performance.



Is this analysis a one-time approach to improvement? No, the approach works on an on-going basis, contributing to continual improvement.

One software supplier, EMNS, affirms its Software-as-a-Service product GSQA® has the capability to provide each of the three components: collect, analyze and monitor. According to John McGlenn of EMNS, they have worked with a number of food and beverage processors with good results. “A candy manufacturer tells us the approach has cut costs and increased quality. Another company has virtually eliminated incoming ingredient rejects, resulting in improved scheduling and production efficiency. A third customer manages ingredient data with GSQA automation and analysis that could never be achieved manually.”

Summary

Can we make every batch a great batch? No, but we can consistently identify the cause and effect behind terrible batches and lift the ranking of every batch. The end result is improved market performance and therefore, profitability. We can eliminate the batches that lose money. We can increase the financial contribution of many if not all batches. If we collect, analyze and monitor the information, we can apply the tools to make business improvement a reality.

About the author:



Olin Thompson is a consultant who specializes in the application of information technology to manufacturers. He works with manufactures and software development companies to improve the positive impact on both industries. A frequent author and speaker, he is known for his creativity and his ability to communicate complex concepts into actionable, common sense language.

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