

# Building Business with Thermal Profiling

## Executive Summary

**Building your business during turbulent times can be easier than you might imagine. With the right tools and approach, you can capture market share, expand your geographic sales footprint and reduce operating costs at the same time. Thermal profiling is the key to optimizing the baking process and exploiting extended product shelf life. With minimal investment and excellent returns, implementing thermal profiling is a great way to build your business.**

## Could your company use more business?

It's the one thing we all have in common- we all want more business! And whether you are a commercial baker with national reach or a local artisan baker, you only have a couple options: sell more product to existing customers or sell product to new customers. In the face of saturated customer demand, selling more product to existing customers can be difficult. After all, there is a limit to the amount of product that people can consume each day. Then there is the other alternative-

### Serving more customers...

To many, serving more customers means increasing market share through an increased marketing effort. Considered from a different perspective, new customers can be acquired most easily in two ways:

- by providing fresher, higher quality product and
- expanding the market you serve.

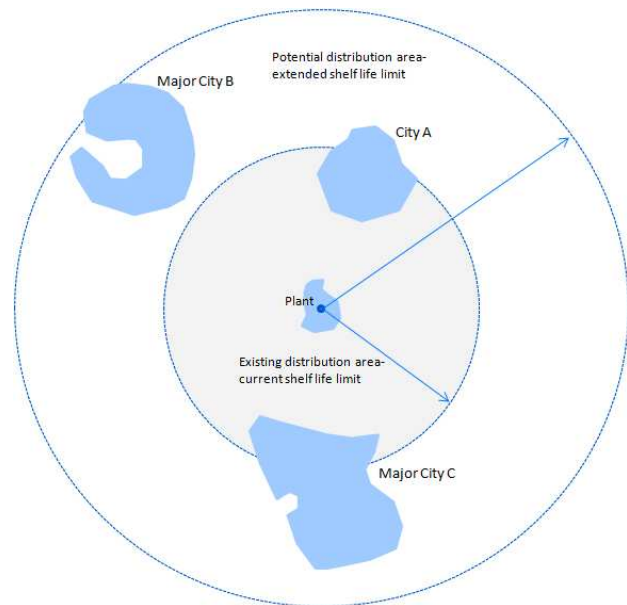
Let's see what ties these two approaches together.

### Extending shelf life is the key...

It is easy to understand that, as in the figure, extending shelf life can allow distribution to more distant retail outlets, but the business impact is even greater. Imagine that we could extend shelf life so that, even at the end of code, the product is still fresh. Now we can provide a high quality, fresh product that is so irresistible that customer loyalty is secured and recommendation by word of mouth helps build brand recognition and capture market share.

Extending shelf life can also increase existing market penetration by changing the distribution economics for low volume retail outlets. Most bakeries know of retailers in their geographic market area that fall below the sales volume required for a profitable relationship. These retailers may be very attractive for a variety of other reasons, for market presence or product positioning, and yet the cost of servicing these retailers is prohibitive. By providing high quality product with an extended shelf life, these stores can meet increased sales volume targets and at the same time distribution costs can be reduced bringing these stores back into play. This allows a more complete market presence and further increases market penetration.

So from several different angles, extending product shelf life is a game changer for bakeries large and small.



## The nuts and bolts...

If you have made it this far you are probably thinking, “Okay, but how do I get these benefits for our company?”, so here are the details you need. The most common problem is that bakers cannot see shelf life, so it needs to be measured, tracked and communicated throughout the bakery. Most bakeries use quantitative methods such as texture analysis or stress relaxation to assess product staling and shelf life. The next problem is that bakers may not know how to adjust their processes to optimize shelf life. We discuss two examples of how this can be done. The first example looks at how artisan bread bakers can optimize product shelf life while the second example shows how commercial bakeries can do the same.

### *For artisan bakeries*

Artisan bakers are often driven by their desire to produce high quality product using traditional ingredients and processes. This usually means spending time and effort selecting ingredient sources, perfecting processes (sometimes by trial and error) and then maintaining consistency throughout their bakery. Historically it has been difficult for artisan bakers to make the connection between their baking process and shelf life, however now this is quite straightforward. Optimal shelf life is obtained when all aspects of bread baking are optimized as well, so optimizing the baking time vs. temperature profile naturally leads to optimal results. This means that the baker should seek a bake cycle that yields bread that is completely done without being over baked. This can easily be obtained by using a thermal profiling system to measure and optimize the bread baking profile and then periodically using the same system to maintain production consistency.

Even if your artisan bakery processes are optimized there is still plenty of room to grow. With the production of par baked and in-store baked products you can expand your business without compromising quality or that fresh baked experience. In the growth and maintenance of these product types, total process specification and verification are crucial with thermal profiling playing a pivotal role.

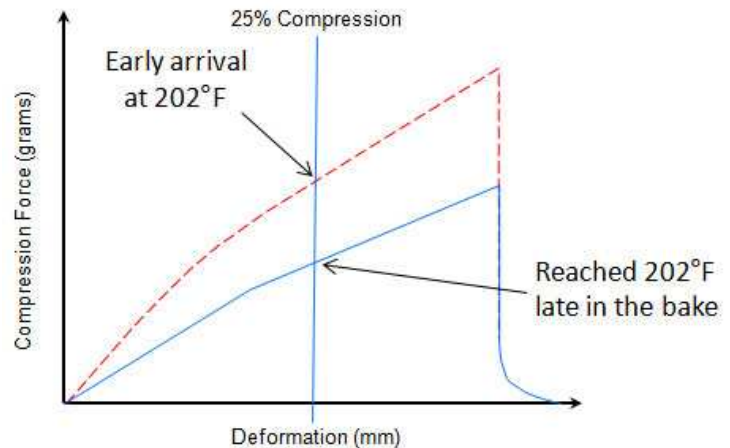
### *For large commercial bakeries*

For commercial bakeries the goals are similar, but the process considerations are different. The major differences arise from the use of enzymes to extend shelf life.

When using enzyme technology to extend shelf life there are three goals:

- use as little enzyme as possible to get the desired effect,
- give the enzyme as much time as possible to act, and
- make sure that the enzyme is inactivated toward the end of the baking process.

In this case the baker adjusts the time vs. temperature profile to maximize the time the enzyme can act while making sure that the final temperature is sufficient to both inactivate the enzymes and ensure that the loaf is fully baked. Achieving an optimized process requires the baker to hit certain time vs. temperature milestones. Among these are early starch gelatinization, relatively late enzyme inactivation (80 to 90% of the bake) and attaining the final core temperature late in the bake. By achieving this balance, bakers can ensure consistent product with proper moisture content and optimized shelf life.



Typical Texture Analysis Results

### Additional benefits...

Many bakeries report additional benefits from using thermal profiling to optimize their baking process. Some of the benefits most commonly cited are:

- more consistent and higher quality products
- fewer quality related line stops
- a sharp reduction in the number of stales<sup>1</sup>
- less frequent production runs leading to more flexible production scheduling
- increased plant efficiency and lower labor costs (elimination of overtime)
- more time for new product introduction

### Really build your business...

Remember the old adage “when the going gets tough, the tough get going”? It still rings true today! If you are a baker, large or small, you need to use all the tools at your disposal to build your business. Previously, thermal profiling was seen as a luxury, but in today’s environment it has become a necessity. It is one of the few tools that enables rapid business growth while decreasing operating costs.

### References

1. Sosland, Josh. “Role of technology likely to be riveting in coming years.” *Bakingbusiness.com* Dec. 28, 2009

Magna Systems is a global supplier of measurement solutions for the food processing industry. Additional information is available on the web at [www.magnasystems.net](http://www.magnasystems.net)