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TIPS FOR INCREASING BATTER DEPOSITING ACCURACY

A White Paper by Unifiller Systems Inc.

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INTRODUCTION: WHY IS DEPOSITING ACCURACY SO IMPORTANT?

According to [Bake Magazine](#), depositing accuracy refers to two different things. There's the ability for the equipment to hit the right target whether that's the cake pan, tray or individual piece of dough being filled or topped. Then there's how much batter or filling is being deposited. That weight must also be extremely accurate to keep bakers from giving product away.

Leveraging automated equipment like servo-driven depositors is a great way for maximizing output and maintaining quality control. However, it's important to note that these things don't just happen without fine-tuning your recipes with the machine. Without making sure your batter is compatible with the depositor or the depositing speed is adjusted properly to the cake pan, bakers will likely have to spend additional time and money on wasted ingredients and top-ups.

Common problems that arise during batter depositing include the following (as cited on [The Bakery Network](#)):

1. Underweight and/or overweight deposits
2. Damaging product during depositing (such as inclusions in the batter)
3. Trailing or spillage of product during depositing

The impact of inconsistent depositing on production time, efficiency, and cost is significant. The largest consequence of inaccurate depositing is a hit on the overall profit, as bakeries cannot charge extra for products that weigh more than the label weight. Damaged products may lead to a product rejects, which then lead to bakeries spending extra money on ingredients for the rework. Trailing or spilling of product leads to extra overhead costs to purchase new ingredients to make up for lost product, not to mention large amounts of food waste.

To help bakeries and bakery manufacturers avoid such an exorbitant drain on resources, let's take a closer look at the factors that affect depositing accuracy.



FACTORS AND FIXES THAT AFFECT DEPOSITING ACCURACY

When it comes to depositing batter, there are several critical factors to take into account. The following points are credited to Emilio Cabrera, Service Technician at Unifiller.

FACTOR ONE — THE MACHINE’S EFFICIENCY. The depositor’s air cylinders have to operate in an agile way for control; otherwise, weight variance in the final product may occur due to part of the product returning to the hopper or getting sucked back into the outlet. The batter can even get pressurized if the outlet’s actuator is slow, which adds to another source of weight variance.

THE FIX — Your depositor should have an adequate air supply in terms of quality and installation, meaning that no water from condensate, dust, or other contaminants like oil should be present. It is also best to have the right air capacity, which takes a good pipe and hose size and length to deliver the air required for each minimum air pressure drop.

FACTOR TWO — BATTER HOMOGENEITY. This could be hard to notice but it can actually be more common than expected. Depending on how the batter is mixed and handled, the depositor may recharge different product concentrations every time as the hopper is replenished with new batches or adjusted. This can be more noticeable in pneumatic depositors.

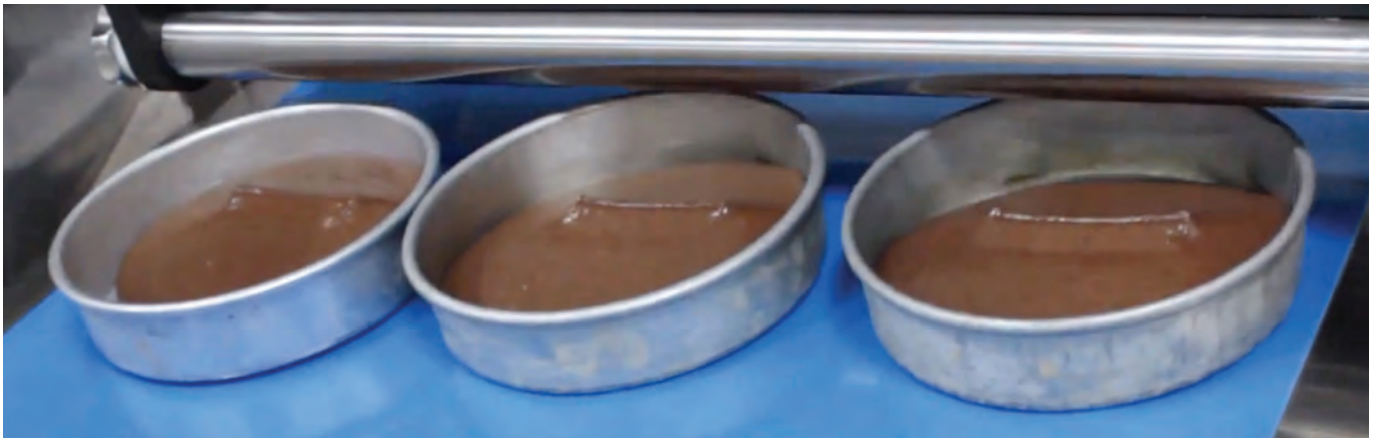
“Batter and filling consistency can have a major impact on deposit accuracy, as well as the final product quality,” explains Sonia Bal, Director of Marketing at Unifiller Systems. “As batter sits in the mixing bowl or hopper, waiting to be deposited, it can get thicker, and some aeration from the leavening agent can occur. This can impact depositing consistency.”

THE FIX — Consistency in batter preparation and handling will help make a uniform batter, which would then stabilize depositor performance. The freshness of the ingredients, the preparation procedure (control of quantities, time, order, mixing speed, etc.), batter handling (dwell time in containers or in the hopper, the transfer pump speed—too high and it could affect the batter), and room conditions (temperature, humidity, atmospheric pressure, etc.) all play a role in standardization and must be carefully monitored and controlled by a Quality Assurance inspector, especially when the operation is large.

FACTOR THREE — BATTER VISCOSITY. If the batter is stiffer than usual, it may depend on the machine’s ability to recharge it and efficiently to fill up the product cylinder chamber on each cycle. The machine maintenance schedule needs to be in good standing for maximum efficiency.

TIPS FOR INCREASING BATTER DEPOSITING ACCURACY

THE FIX — In this case, it is recommended to slow down the recharge speed to mimic the batter's natural behavior. The vacuum that the machine has to create will require an excellent seal. The hopper gasket and the rest of the O-rings in the depositor have to be in good shape; in this case, inspecting and changing them more often would be necessary. Lubrication is crucial here, not only to extend the life of the O-rings but to ensure that any minor gaps in the O-rings are “plugged” by the lubricant to improve the sealing effect. The combined effect from moderating the recharge speed and efficient sealing allow for better suction and a more consistent portioning of batter.



FACTOR FOUR — SPECIFIC GRAVITY. The Specific gravity is an important factor when depositing aerated batters. Typically, the recharge speed needs to be reduced if tunneling in the hopper happens. This would be the case of a very light batter in which the high recharge speed makes the air enter through hidden passages created in the depositor hopper. When the batter is very aerated, its delicate micro-air-bubble structure may easily break.

As the batter transitions between the different chamber areas during the recharge or deposit stages, it becomes strained. Also, if the nozzle outlet actuator is slow for the reasons explained above, the batter will be pressurized, which would very likely affect its structure once again. If the deposit speed is too high as the product expands on the outlet, its structure will break as it passes through the nozzle tip border. The effect will be seen after the batter leaves the oven, as the baked product will not rise as expected.

THE FIX — This calls for a reduction in the recharge and deposit speeds or for an improvement in the machine's efficiency by conducting good maintenance and providing a proper air supply. In addition, slowing down the recharge speed gives time to the batter to “sit” in every cycle and prevent breakage as it is pulled from the piston.

MORE TIPS FOR INCREASING DEPOSITING ACCURACY

AIM FOR A CLEAN CUT-OFF

Making sure your equipment's nozzle have a clean cut-off ensures that batter won't drip and tail as it's being deposited. It's also important to check that your depositor's spout and nozzle are suitable for the type of batter you're working with.

For bakeries that can afford the more expensive servo-driven machines, the precision granted by automation would greatly help with achieving a clean cut-off during deposits. As Charlotte Atchley, Editor at [Bake Magazine](#), writes, "Servo technology also can play a role in preventing leaks and drips. In addition to providing control over deposit weights, it gives precise control over the rotary valve."

MAKE WAY FOR INCLUSIONS!

Regarding the aforementioned factors that affect depositing accuracy (batter homogeneity, viscosity, gravity), classic, single-flavour dessert batters are typically easier to measure. Batters with inclusions and particulates are another story.

In an article on [depositing for small cakes and fillings](#), Atchley points out the following: "While exact product weights may be the highest priority in depositing, bakers need to be aware of how particulates and changes in batter consistency can impact the accuracy of their deposits. Particulates add a layer of complexity to depositing cake batter and filling for small items. Their presence can affect a depositor's performance because they differ in density from the batter or filling. The depositing nozzle could impact particulate integrity, and particulate distribution is just another thing bakers need to keep an eye on."

Types of inclusions found in baked goods vary on a wide scale. They can be hard like nuts, soft and stringy like carrots, or prone to discolouration like berries. Regardless of their characteristics, inclusions must be evenly distributed—without getting jammed or crushed—throughout the batter to maintain a good end-product.

"In instances like this, the equipment may need to account for larger openings or attachments. Unifiller addresses this challenge with larger apertures, which means our design has less restriction on batter flow and gentler action when drawing in the batter and depositing it," says Bal. "While this helps with delicate chiffons or sponge cakes, larger apertures also address challenges that arise when depositing heavier, stiff batters and batters with large inclusions."



By enlarging the port from the hopper, Unifiller has removed areas where large inclusions could get jammed in the depositor. A variety of nozzles and attachments can be used to tackle common depositing challenges such as dealing with mixtures that don't have enough liquid to self-level or contain mainly particulates with little liquid to make the product flowable.

STANDARDIZE RECIPES

Deposits should be accurate and repeatable, but what happens when a cake recipe is altered? Sometimes, what's good does not need to be made better, especially in processes involved in large-scale operations. One change to part of the process can affect other processes downstream.

Bal explains, "Depending on the ingredients they add to or remove from formulations to achieve the results they desire, manufacturers can find themselves dealing with doughs or batters that are thicker, stickier or otherwise different from the original recipe. It's important not to change the recipe too much—especially if the product in question is a popular product. Changing the recipe can impact the product's look, feel, and taste."



CHOOSE EQUIPMENT THAT IS VERSATILE

While recipe standardization is necessary for a continuity of operation productivity, it's worthwhile to acknowledge the way market challenges might affect bakeries' product offerings. For example: with COVID-19 limiting in-person gatherings in 2020 and 2021, bakeries have opted to adjust their products to smaller serving sizes to meet consumer demands. Smaller servings means that depositing challenges may be more pronounced.

"The depositor's target becomes harder to hit. Inclusions and changes in specific gravity have a bigger impact on accuracy. Versatility becomes a top priority for depositing products that vary in size and batter consistency."



Standardization may be relevant in terms of recipes, but it's flexibility and versatility that is key when choosing depositing machines and equipment. Using machines that are modular and built with a versatile design can effectively help bakeries and manufacturers circumvent challenges such as product changes.

FINAL NOTE

Improving depositing accuracy brings many benefits to bakery production, not the least of which include reducing overhead costs, tightening quality control, increasing productivity, and minimizing food waste. It's also one example in which improving one aspect of production brings further downstream efficiencies.

It all comes down to having the proper machine know-how and selecting the right equipment. Ultimately, it's about choosing the right OEM to partner with. Choose an equipment manufacturing company that fits into your niche, understands your production needs, and cares about providing you with the right solution.



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