Choose Your Own Quality Adventure

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HOP & BREW SCHOOL

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WHAT IS A CONSULTANT?

How can they help my business thrive and take on new challenges?

A consultant is an expert who gives professional advice to individuals and companies in their area of specialty, generally on a contract or short-term basis.

Consultants are often are tagged in for parts of your business which are in a start-up / growth phase or existing programs where a major change in direction is needed.

Here are some "consultants" by a different name that your business might already working with:

- Lawyers
- CPA or Accountant
- Graphic or Label designer
- Human Resources Specialist
- Compliance Specialist
- IT Specialist

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WHAT IS A CONSULTANT?

What does a technical consultant do?

These are my areas of expertise:

- **Product Development** – I provide brewing expertise to help raw materials suppliers launch in craft beer with the right product, package, and process.
- **Quality Management** – I help breweries start or streamline their labs, design quality programs for new products, or respond to major quality issues.
- **Sensory Science** – I support breweries who want to create robust sensory programs for both quality and innovation with strategy, training, validation, and analysis.
- **Data Visualization** – I advise breweries and suppliers who want to turn their data into actionable insights about their business.

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CHOOSE YOUR OWN ADVENTURE

Group Activity Introduction

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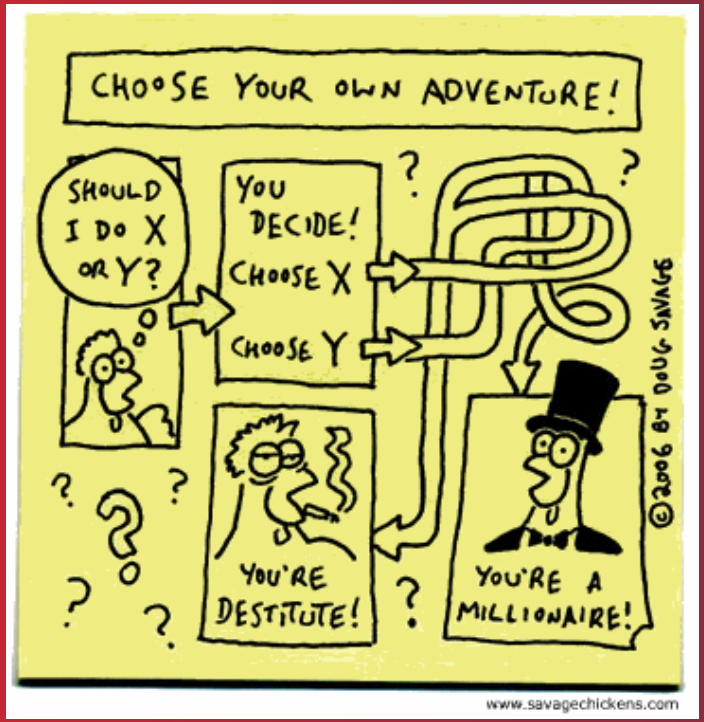
INSPIRED BY CHOOSE YOUR OWN ADVENTURE GAMEBOOKS



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Presentation Flow

Setting the Stage

Stranded on a desert island?

Scenario 1

Quality Issue

Scenario 2

Raw Materials Swap

Q&A

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STATE OF CRAFT BEER

Setting the Stage

You own a craft brewery during the **worst economic time the industry has seen since Prohibition.**

You and your brewery just made it through a **global pandemic** which remade the social fabric and life of our society. The pandemic crippled the institutions where people would meet in person indoors to drink your product – like restaurants, Taprooms, and bars – and forced you to **profoundly shift your operations, sales, and marketing** in both strategy and day-to-day.

Staff morale is low. **You and your team are burnt out**, shoulders hunched from the weight of the personal and social changes you've lived through.

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STATE OF CRAFT BEER

Setting the Stage

Overall **sales volume is down 5%** year over year. **Growing materials costs** are outpacing price increases, leading to **shrinking profit margins**. Demand for craft beer is no longer outpacing supply, leading to **a zero-sum competition for growth** between you and your best buddies in the industry.

Polling data show that your customers are becoming aware of the negative impact of alcohol on their health and relationships and are **rethinking their consumption**.

Now, more than ever, **the quality of your product and service** will make or break your business.

Gatza & Watson 2024 (Brewers Association)

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HOW TO PLAY

Choose Your Adventure

Elect a Table Captain, who has the option to wear the stylish paper crown in the center of your table.

Each table will have 2 minutes on the clock to discuss as a group and decide which path to take, A or B.

Table captains will communicate the table consensus by holding up a paddle with either A or B.

Majority wins. We'll move forward with the group consensus.

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HOW TO PLAY

Choose Your Adventure

Choose your table captain now!

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CHOOSE YOUR OWN ADVENTURE

Let's do this thing!

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Scenario 1: Customer Complaint

Your Taproom has recently received several complaints from loyal customers about a batch of your flagship pale ale.

The complaints consistently cite an off-flavor described as "buttery" or “oddly sweet” that wasn't present in previous batches.

The problematic batch number is 345A, produced 3 weeks ago. The batch was brewed, fermented, and packaged without any noticeable issues during production. It has been on tap for about 2 weeks.

You think the off-flavor is probably diacetyl, but you’re not quite sure how to approach this problem, since it hasn’t happened to you before.

What will you try first?

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It's Your Choice

OPTION 1A: Call a friend who works at a big brewery in your area

Your friend Joe works in the cellar at a big brewery nearby. He sometimes helps you out with a new yeast pitch, and he has a brewing degree, so you think he'll have some good ideas about where to start.

Go to Slide #14.

OPTION 1B: Call a quality consultant

You are taking this problem seriously, since you know that your brewery's reputation is on the line, so you call up a quality consultant who advised another brewery in your area when they had an infection. You're a little nervous about how much it will cost you, but you also know that it would be expensive and inconvenient to dump multiple batches of beer.

Go to Slide #22.

Option 1A: Call your friend who works at a big brewery close by

You really like Joe and appreciate his help, but you were hoping for more guidance.

It might be wise to reach out to an expert...maybe the professors at the brewing program where Joe got his degree could help you?

It's Your Choice

OPTION A: Take Cellar Joe up on his offer to run some samples

Cellar Joe has generously offered to run some samples in his brewery's lab, but he wasn't very specific about timeline or what you could do in the meantime about the issue. You've got a lot on your plate, though, so you cross your fingers that it will all work out. Once you get results, you can hopefully connect with his lab guy to figure out how to fix the problem.

Go to Slide #16.

OPTION B: Reach out to the local brewing degree program

You appreciate Cellar Joe's offer, but you would like a little more guidance on what might be causing the problem so you can troubleshoot. Hopefully, the professors at your local brewing program can take some time to explain what might be causing the problem and what you can do about it.

Go to Slide #22.

Option A: Take Cellar Joe up on his offer to run some samples

You are starting to get frustrated with how slow everything is moving in solving this problem. Obviously, your issue is low priority for your buddies, who are just doing you a favor. Maybe you should call up that quality consultant after all?

It's Your Choice

OPTION A: Sit tight and wait for micro results.

You know that this is a major issue, but you've got another batch on tap, so you're not too worried about getting quick results. You decide to wait until micro results come back. After all, you have a LOT of other tasks on your plate, and it's almost the weekend.

Go to Slide #18.

OPTION B: Call a quality consultant

You are fed up with waiting for results and incomplete advice, so you call up a quality consultant who advised another brewery in your area when they had an infection. You're a little nervous about how much it will cost you, but you have exhausted all your other options and just want results before this issue ruins your brewery's reputation.

Go to Slide #19.

Option A: Conclusion

DEAD END. You lose a bunch of revenue. START OVER AT SLIDE #12.

Option B: Call a quality consultant

Option B: Call a quality consultant

Supplies for VDK sensory:

- Water bath ($150-$500) and glass bottles ($25) via Amazon
- Used benchtop centrifuge from Ebay ($150)
- McCormick butter extract from the grocery store ($5).

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Option B: Call a quality consultant

After she is done reviewing your recipe, you get a detailed email from your consultant. **Go to Slide #32.**

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Option B: Reach out the local brewing program

DEAD END. RETURN TO SLIDE #16.

Option 1B: Call a quality consultant

She identifies three potential sources of diacetyl:

1. dirty tap lines
2. ineffective diacetyl rest
3. contamination with Pediococcus or Lactobacillus bacteria

You need to decide where to focus your limited time and effort next.

It's Your Choice

OPTION A: Focus on evaluating the current batch

You would really like to save this current batch if possible, since your brewery operates on thin margins, and it would be a big pain to reorganize your brew schedule to add in another pale ale batch. Your priority is also to understand the root cause of the issue first so that you know what to look for next as you see how widespread the issue is.

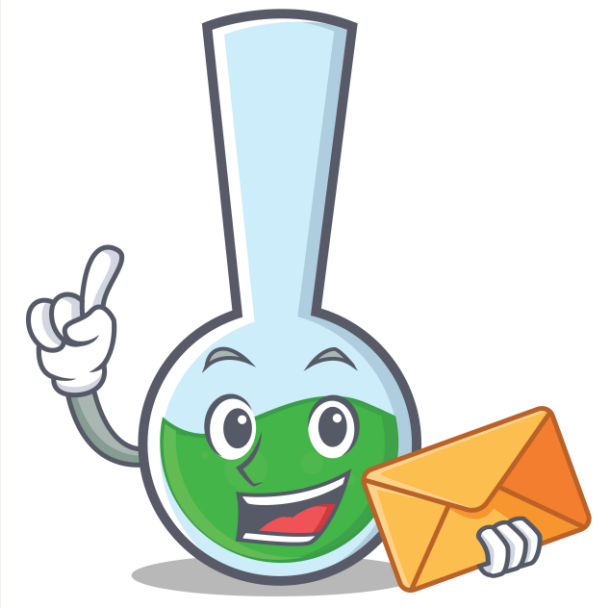
Go to Slide #25.

OPTION B: Write off the current batch and focus on future batches

Your biggest priority is to evaluate the new batch to see if it has the same problem and to figure out if the issue is brewery-wide or limited to this brand. You care less about trying to save or understand the faulted batch; in your mind, there are diminishing returns to this batch, which is only going to get less fresh as you try to figure out what is wrong with it.

Go to Slide #28.

Option A: Focus on the Faulted Batch



Supplies for VDK sensory:

- Water bath ($150-$500) and glass bottles ($25) via Amazon
- Used benchtop centrifuge from Ebay ($150)
- McCormick butter extract from the grocery store ($5).

In 5 days, you receive the following results:

- VDK = 200 ppb
- HLP tubes = negative

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Option A: Focus on the Faulted Batch

You are feeling pretty deflated because you can't see any way around it: you'll have to take the pale ale off tap during the weekend, and your customers will not be happy.

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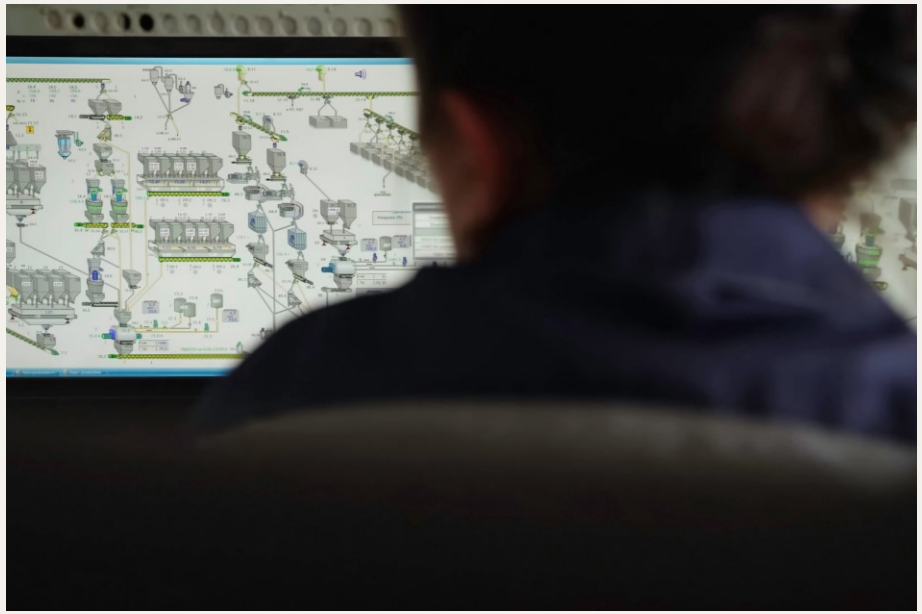
Option A: Focus on the Faulted Batch

“Let’s drill into your process… Send me over a summary of your recipe and process with times and temperatures. I’ll take a look this afternoon and give you feedback by tomorrow morning. Do you have another pale ale brew in-process?”

Go to Slide #32.

Option B: Focus on Future Batches



Supplies for VDK sensory:

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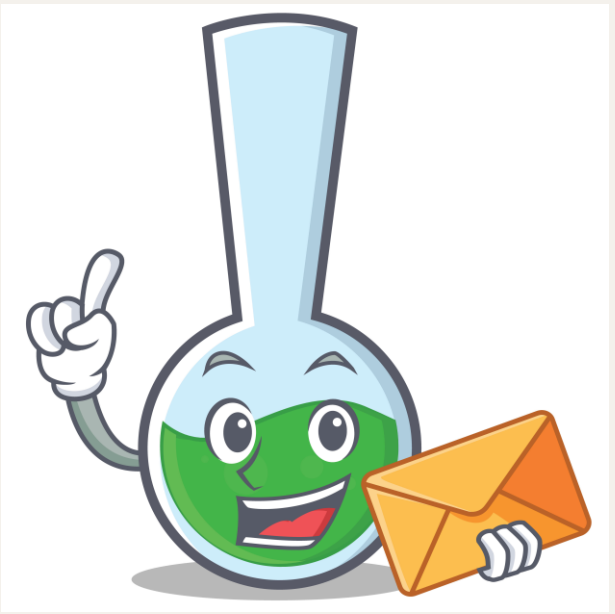
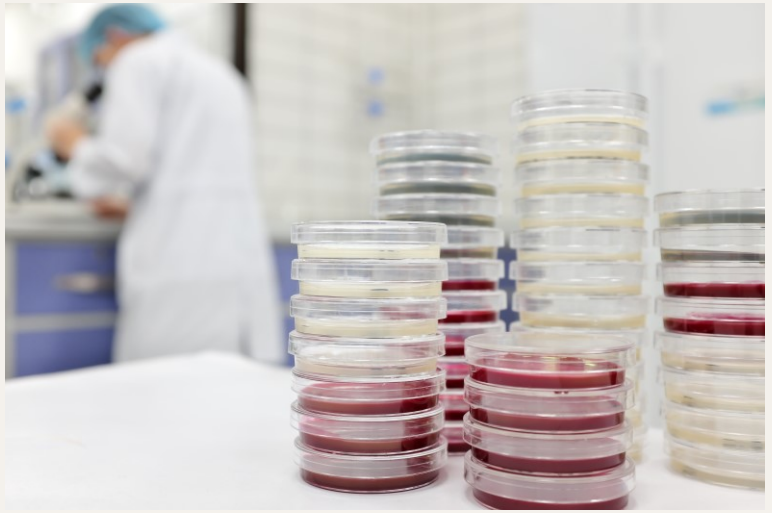


Option B: Focus on Future Batches

When heated, your panel thinks that the new batch of pale ale is as bad or worse than the first one. “Uh-oh. Only a matter of time,” your consultant says when you tell her the news. “Let’s drill into your process to see if the diacetyl could be from your diacetyl rest or from dry hop creep.”



Option B: Focus on Future Batches

After she is done reviewing your recipe, you get a detailed email from your consultant. **Go to Slide #32.**

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It's Your Choice

OPTION A: Keep T-90 hop pellets with an earlier dry hop, earlier yeast harvest, and extended VDK rest

"If you want to keep the T90 pellets because you like the aroma profile, I encourage you to add them earlier. We'll need to tweak your yeast harvest if you plan to reuse that yeast and timing of hop additions. The downside to this is that you'll force the dry hop creep, so you'll need to extend your VDK rest and tank time, and the final gravity will likely go a little drier than your target."

Go to Slide #32.

OPTION B: Shift to Cryo Hops® pellets with careful VDK monitoring

"Concentrated lupulin pellets will likely change the hop profile of your pale ale. Depending on the variety, people think that it increases the fruity aroma intensity of the beer and reduces grassy notes. These can still cause hop creep but it's less common. You'll need to keep monitoring via VDK sensory and wait until beers clear to crash tanks. This option gives you the most flexibility on final gravity."

Go to Slide #33.

Option A: Conclusion

You feel more confident than you ever have in the quality of your beer and your staff's ability to catch any quality issues that arise.

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Option B: Conclusion

You feel more confident than you ever have in the quality of your beer and your staff's ability to catch any quality issues that arise.

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KEY TAKEAWAYS

Time is precious when responding to quality issues.

Ask for help to save time.

The help you pay for works the fastest for you.

Avoid escalation by thinking future.

Quality problems tend to ramp up quickly if left unchecked.

Focus on fixing the problem in those in-process batches coming down the pipeline.

Dumping a batch or recalling it is usually more expensive than quality testing or quality investments.

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KEY TAKEAWAYS

Low hanging fruit first.

Try the easiest solution before you try more complicated solutions.

Everyone is part of your quality team.

While the customer is not always right (and quality issues in the market are not always within your control), customers who complain are giving you valuable information.

Empower your whole production staff to identify issues, make process improvements and capture best practices.

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CHOOSE YOUR OWN ADVENTURE

Let’s take a breath before charging into another adventure!

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Scenario Two: Raw Materials Swap

Your small brewery is looking to reduce costs by switching base malts. Right now, you use pre-milled Pilsner malt from a small, local maltster in your region (#sustainability). You just bought a used mill from another small brewery nearby who went out of business, and it got installed with a conveyer last week.

Your current base malt has a small but noticeable flavor impact on the beers you brew with it, including a pale ale, stout, and adjunct lager. Your first thought is to switch to whole kernel malt, which will save you 20% of the malt cost.

You also want to explore using substituting base malt from a large supplier to cut costs, which are growing rapidly. Using malt from the large supplier would save you an extra 10% if you fully switched over all recipes. The new supplier offers a similar base malt, but you need to ensure that this switch won't negatively impact the flavor and quality of your core beers.

Scenario Two: Raw Materials Swap

You also want to see what changes in terms of extract, mash efficiency, and physical performance in the mash tun for your house-milled malt and to troubleshoot if any issues arise.

Your brewery has a small sensory panel of 6 staff members to help evaluate any flavor changes. You have access to basic brewery lab equipment. You have a 5-bbl brew house. Unfortunately, you do not have any sort of piloting capacity, meaning that you will need to brew full 5-barrel batches to test the flavor impact of these new malts.

With limited time and resources, you need to decide where to start your evaluation.

It's Your Choice

OPTION A: Start with Benchtop Trials

Before you make huge changes and brew full-size batches, you want to dial in your mill and compare your local malt against the big supplier's malt from a flavor and extract perspective.

You have used the ASBC Hot Steep Malt Sensory method in the past and think it would be helpful.

Go to Slide #43.

OPTION B: Start with Brewing Trials

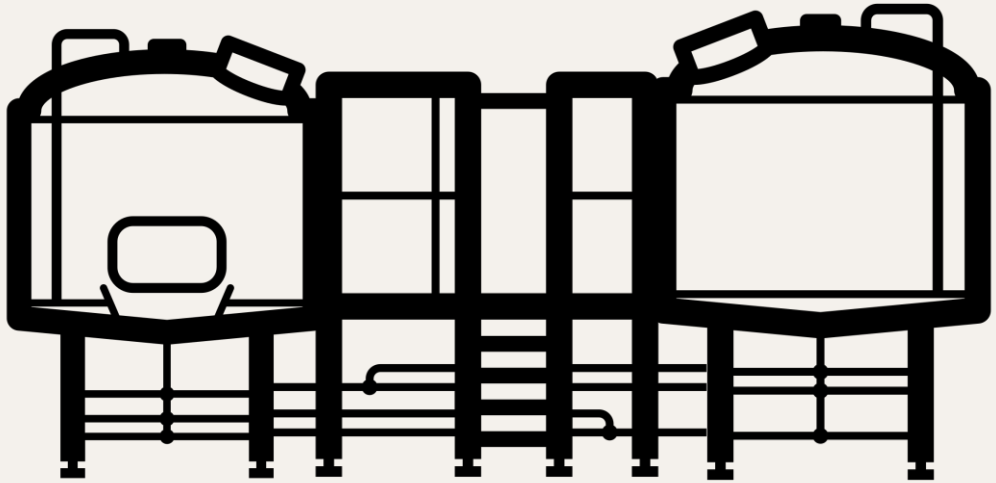
You wish that you had the time to do benchtop trials, but it's your busiest time of year, and you can't imagine spending the time on anything but getting beer brewed and out the door.

You're willing to take the risk of small differences in flavor and extract as you dial in your mill with full batches.

Go to Slide #41.

Option B: Start with Brewing Trials

You order in enough bags of malt to brew a 5-BBL batch of your Pilsner: half Pils from the big supplier and half Pils from the local maltster.

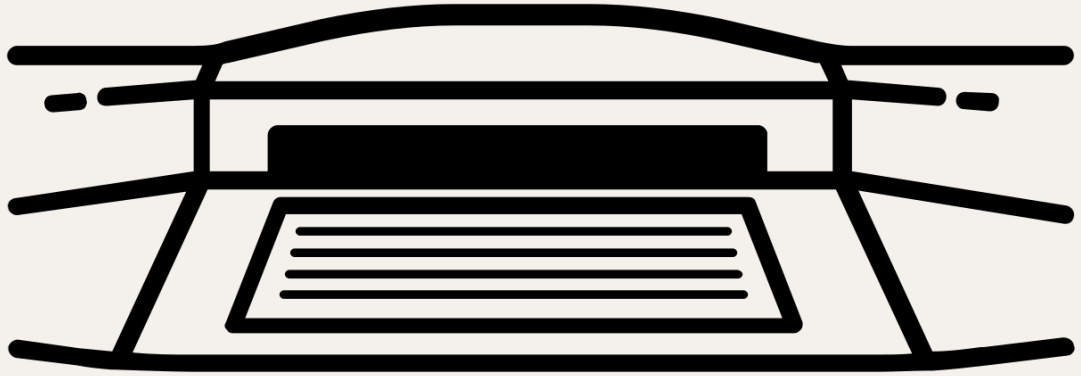


You notice something strange: there seem to be a more whole kernels and big pieces of barley than usual.

Option B: Start with Brewing Trials

Darn those whole kernels. You don't even bother to pitch the yeast – this wort will have to go down the drain. You order more pre-milled malt and schedule another brew for later this week, putting the yeast back into the cooler and keeping your fingers crossed that it will still be good by brew day.

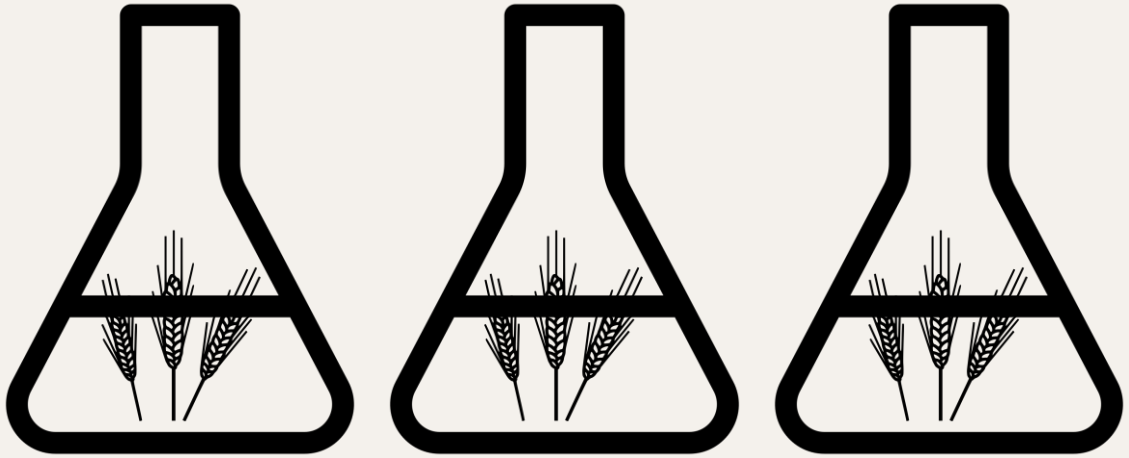
DEAD END. Go to Slide #45 to choose which beer to trial next.



Option A: Start with Benchtop Trials

You compare the two malts visually, and the local malt does seem to have slightly smaller kernels.

Option A: Start with Benchtop Trials



Time for hot malt steeps. You compare the pre-milled local malt, your house-milled local malt, and the large supplier's malt, using the same brewing water. You measure extract, pH, and do a visual estimation of color. You also call in your small sensory panel to run a check-all-that-apply (CATA) analysis using Draughtlab's base malt flavor map.

Option A: Start with Benchtop Trials

You need to decide which beer style to start with for your brewing trials. **Go to Slide #46.**

It's Your Choice

OPTION A: Brew the Pilsner

Trials with your Pilsner will fully showcase malt differences without any distraction with specialty malts or intense hops.

Go to Slide #47.

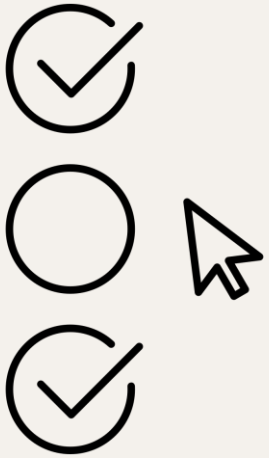
OPTION B: Brew the Pale Ale

Changes to the pale ale might be the most challenging, letting you see how the bready, pasta malt notes of the new base malt play with your hop bill.

Go to Slide #52.

Option A: Brew the Pilsner

CATA results from sensory indicate that the trial Pilsner has more complexity than the previous (control) batch, with a noticeable pie crust note and increased lemongrass character. A tetrad test did not indicate a significant difference between samples.



You need to decide how to proceed next.

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It's Your Choice

OPTION A: Go all in based on the Pilsner results

You are feeling confident that the cost savings, increased efficiency, and increased complexity of the final beer justify the small inconvenience of having to adjust the mill rollers mid-milling so that you can use both base malts. You order in a pallet of Pilsner from the large maltster.

Go to Slide #50.

OPTION B: Run some more brewing trials with the pale ale

The Pilsner results were promising, but you want to see how the pale ale is impacted too, since you still want to see how the bready, pasta malt notes play with your hop bill.

Go to Slide #52.

Option A: Conclusion

You immediately change over all your recipes to a 50/50 blend of base malts and cut your order from your small, local maltster in half. With the increased mash efficiency and milling yourself, you've cut your base malt costs by over 30%.

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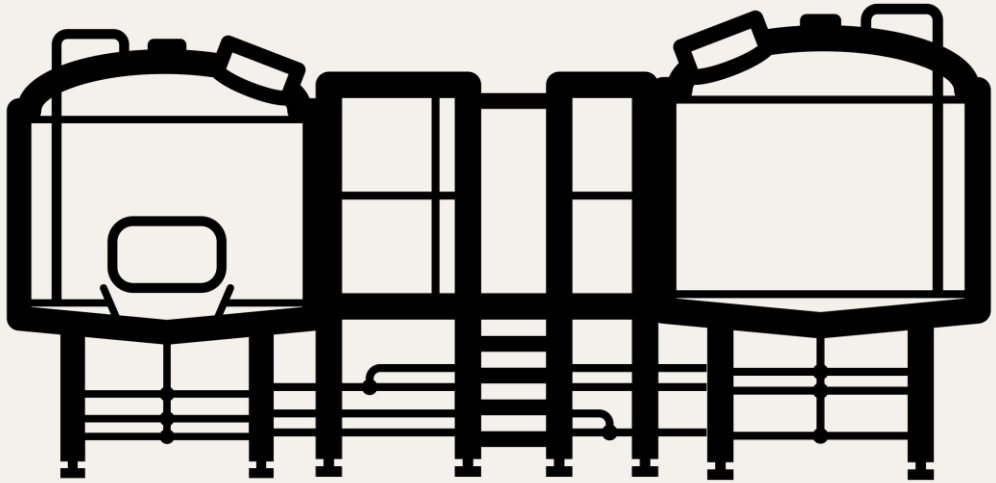
Option A: Conclusion

Next year, your local maltster goes out of business. ☹ You now use 100% of base malt from the large maltster. On the bright side, though, you get to keep your mill settings stable and simplify your inventory. And you survive to brew another day.

Option B: Brew the Pale Ale

You decide to brew the pale ale with a 50/50 blend of the two base malts plus your usual amount of local 2-row malt.



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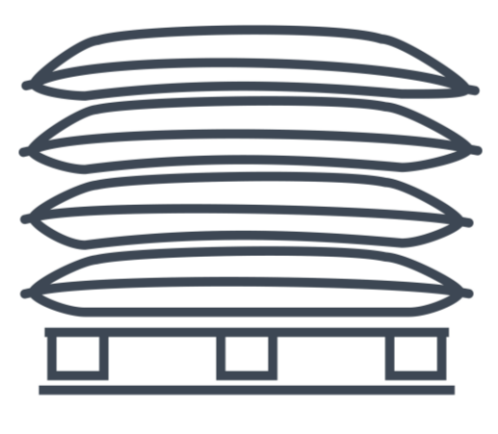
Option B: Brew the Pale Ale

You order in a half pallet of the new malt for your Pilsner and keep using the local malts for your pale ale.



How should you move forward?

It's Your Choice

OPTION A: Keep using the new malt

You have a bit of a headache, but you realize that these complications are just a part of brewing with an agricultural product. It is worth it to you to keep the Pilsner malt because of the flavor impact on your Pils. Plus, it's nice to have another malt to tweak flavors for seasonal brands.

Go to Slide #55.

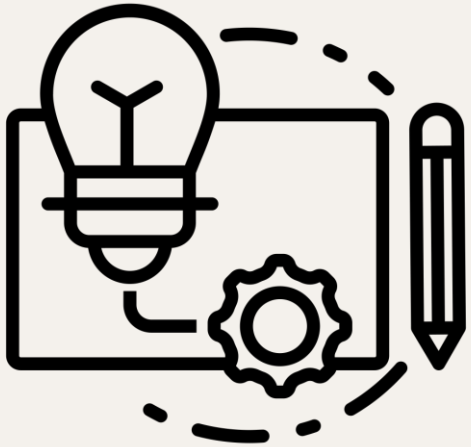
OPTION B: Scrap the new malt

Even though you like the flavor impact of the new malt on your Pilsner, it is getting harder and harder to work with: the DMS issue, the change in mill settings, and now this impact on extract. Plus, you have to keep track of another inventory item. You want to go back to the way things were - simpler - even if it costs you a little more.

Go to Slide #56.

Option A: Conclusion

Despite the headache, you keep using the cheaper malt to make your Pilsner, and it wins some regional awards in the next year. You also find some other areas where you can substitute cheaper materials without impacting quality. Your brewery gains in profitability, and you survive to brew another day.



Option B: Conclusion

You decide to scrap the new malt, realizing that although the actual materials cost is lower, the overall cost including time and hassle probably eats into most of those cost savings. You survive to brew another day.

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KEY TAKEAWAYS

Value consistency in raw materials.

Consistent ingredients are worth a little extra because inconsistency will cost you time: in troubleshooting, evaluation, monitoring, and worry.

Craft means change.

If the product tastes good, a little flavor diversity in your beer is normal and expected. We don't call it "craft" for nothing.

Regulars will probably comment and give you their opinion on whether the change improved or detracted from the beer. Consider it an opportunity to connect.

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KEY TAKEAWAYS

Trial on the bench where possible.

A little time on the bench can save you a lot of heartache and iteration at large-scale trials.

Just make sure to track or write down anything of interest, dosing rates for any ingredients, etc.

Balance ingredient simplicity and flavor diversity.

It's helpful to streamline the number of ingredients you work with to simplify your inventory.

But too much streamlining limits your creative options, resulting in beers that "all taste the same."

Find a balance between the two extremes.

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THANK YOU!

We hope you enjoyed this harebrained adventure!

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Q&A

Ask me anything… Except my favorite hop!

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LET'S CONNECT!

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