

KOJI

Alchemy

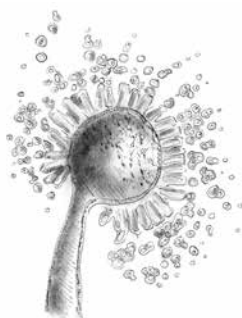
Rediscovering the Magic of
Mold-Based Fermentation

DIGITAL
SAMPLE



RICH SHIH *and* **JEREMY UMANSKY**

Foreword by **SANDOR ELLIX KATZ**



CHAPTER 1

What Is Koji?

You're likely reading this book for one of two related reasons. Either you don't know what koji is and you want to learn more about it, or you do know what it is and want to learn more about it. We don't blame you, as we are learning more about it every day. Indeed, koji is an amazingly transformative and seemingly magical ingredient that has bewitched many people over thousands of years. As you'll discover in this book, one of the many things koji does is turn complex carbohydrates into simple sugars via powerful enzymes it produces in order to feed itself. It is a type of mold used in the production of many foods such as miso paste, soy sauce, sake, jiang, douchi, amazake, makegol, tape, and mijiū, just to name some. Koji has been used for millennia throughout Asia and most recently, in the past 150 years or so, has been slowly conquering the rest of the world in ways that the people who first domesticated it could hardly conceive. Take the charcuterie that Jeremy makes at Larder Delicatessen & Bakery. After the meat is cured and inoculated with koji, the drying time is cut by as much as 60 percent. Imagine being able to make a prosciutto in six months instead of two years.

Koji is an extremely powerful organic technology that has not only shaped the foods of various peoples but also ingrained and transformed their very cultures. Actually, virtually every culture that encounters koji or a food made with or from it becomes entranced by its transformative power. The Japanese have declared it their National Mold and have even created comic books in which it is featured as a cartoon character!

The Many Applications of Koji

With the advent of the internet and the current access that we all have to not just information but materials from all over the world, koji has just begun to be embraced on a world stage. You can now find koji and foods made from it in places far removed from its Asian roots. Restaurant kitchens from Jeremy's casual and laid-back Larder Delicatessen & Bakery in Cleveland, to Rene Redzepi's temple of fine dining, Noma, in Copenhagen, and every other type of resaturant in between. Koji is now widely available, and chefs from a variety of gastronomic identities are beginning to work with it in ways that harmonize with their native food traditions. In fact, koji is poised to transform the world's culinary cultures. From being used to make amino pastes from chocolate chip cookie dough, to using it as an inoculant for European-style charcuterie, koji's potential is materializing before our eyes. Larder is continually pushing to showcase the wonders of koji and has received many accolades for how they use it. Oatmeal cream pies are emboldened with an oat amino paste, pastrami (which can take several weeks to make) is able to go from raw brisket to your sandwich in days compared with weeks, matzo ball soup is elevated to new delicious depths with the addition of a matzo ball amino paste, and vegetables are transformed to taste and eat like cured meat. All of this is possible due to the magic that koji brings to anything it touches. In our opinion the greatest thing about koji's ability to elevate and transform foods is that once you get the hang of working with it, you will see not only the ease with which you can use koji but also the never-ending possibilities.

Curing Meat with Koji

One simple and straightforward way to incorporate koji into whole-muscle charcuterie and other cured meat preparations is to use a wet cure. *Wet cures* are brines in which the meat is submerged, which can be seasoned with herbs, spices, and other flavorings. At Larder we use this approach not just for cured meats that will be hung to dry but also for ones that will be cooked afterward, such as pastrami. This process adds large amounts of umami flavor that develops over the course of the cure. It doesn't have the intensity of the koji-cultured meats, but it still is a stunner. To create a koji brine, follow these steps:

1. Place the meat into a container or vacuum bag large enough to hold it.
2. Add enough amazake to fully submerge the meat. If you are using vacuum bags, you will need far less amazake than if you use a bucket.
3. Weigh the meat and amazake. Calculate 3 percent of its weight and add that much salt to the container or bag.
4. Allow the meat to fully cure based on its size and shape.

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5. If the meat is to be cooked, such as pastrami or certain styles of ham, then do so. There is no need to rinse the amazake brine from the meat before cooking. In fact, we advise against it because it helps create so many delicious flavors as the Maillard reaction takes place.

The other way to cure meat with koji is to incorporate ground fresh or dried koji into a dry cure. As you have noticed throughout the book, we have been highlighting the work of folks who have been using koji in inspiring ways. We feel that it's especially important in this case as there is a narrative that the use of koji in charcuterie is not as "good" as traditional. (We would argue that it's not fair to compare, as they are different in their own rights and each stand on their own as delicious products.) In support of getting feedback from chefs known for being critical, we want to introduce you to Nicco Muratore of Commonwealth in Cambridge, Massachusetts, who has culinary knowledge beyond his years, and has been collaborating with Rich since he started on the koji journey. See the sidebar for his respective thoughts on and approaches to curing with koji. Muratore is highly regarded among his peers and receives acclaim for the foods that he creates.



Husk Savannah's amino pastes: tomato, chanterelle, and Hubbard squash. *Photo by Andrew Wang.*

PRACTICAL CHARCUTERIE

Nicco Muratore

At Commonwealth we have the pleasure of working with beautiful heritage pigs. Working with the whole animal allows us to utilize cuts that are not always available to folks purchasing primal, subprimal, or market cuts. Before I started working with koji, we already had a small curing program in place. We would take the cheeks and cure them for guanciale, the back fat for lardo, the neck muscle for coppa, and so on.

One day Rich and I were making some guanciale, messing around with different cures for each one. He decided to add some koji to one of the cures to see what would happen. We already knew the enzymatic power of protease enzymes on protein substrates, so why not attempt to add the koji flavor bomb to our charcuterie? The result was an incredibly flavorful, unctuous, nutty, melt-in-your-mouth piece of cured meat. It also happened to slightly accelerate the drying process and yield a properly dried piece of cured meat (30 to 40 percent weight loss) in two-thirds of the time.

Traditional cured meats are already packed with umami. The protein is broken down by enzymes as the meat dries out, releasing the amino acids that we taste as umami. Using koji has allowed us to introduce these enzymes from the very beginning of the curing process, and elevate the flavor of the cured meat in a different way.

NICCO'S KOJI COPPA

Nicco loves coppa, a cut of pork shoulder that is rich in fat. It is to butcher yourself and considered by many to be a great cut of meat to start with when making dry-cured meats.

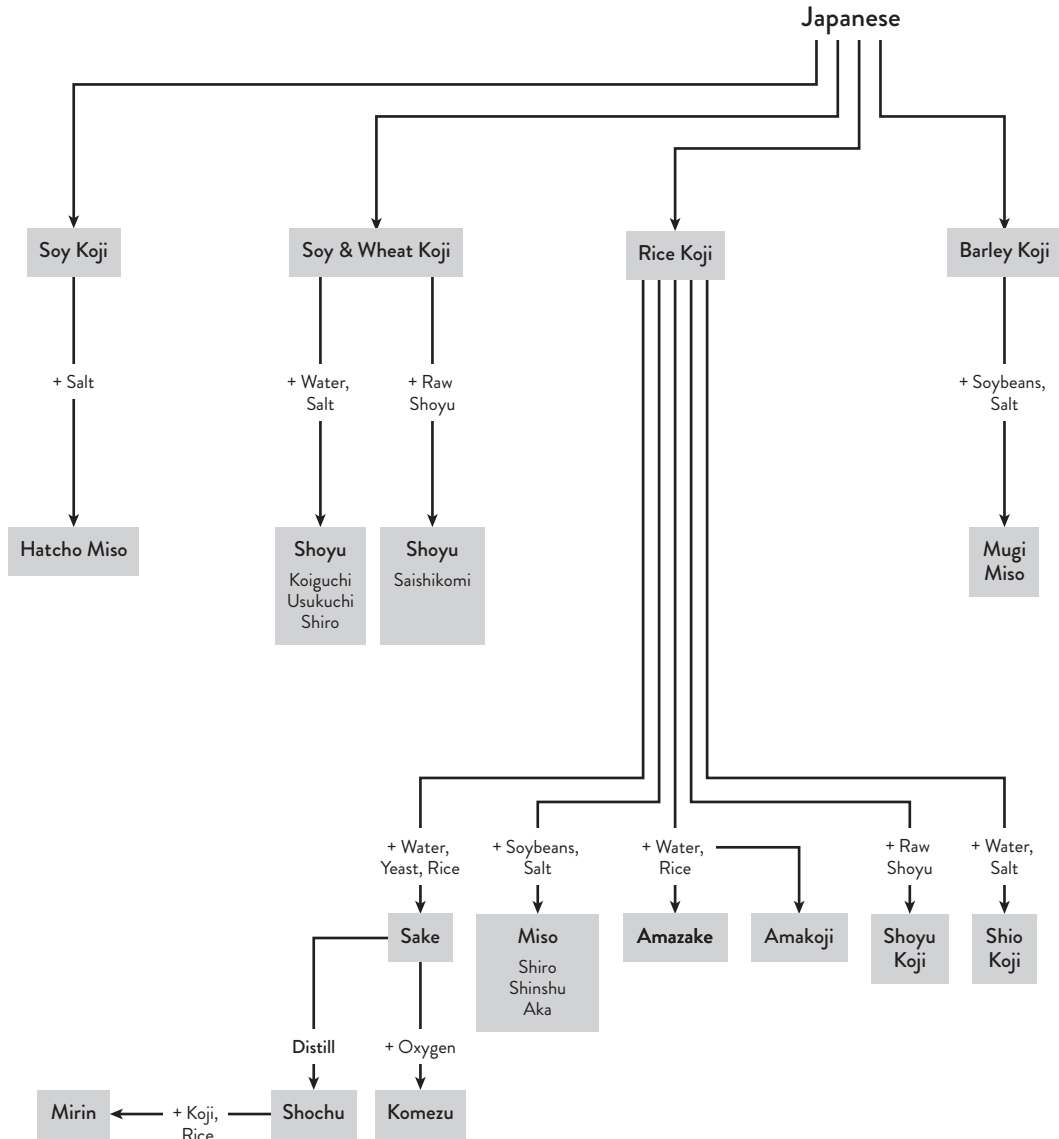
Measurements for salt and koji are by percentage weight of the whole coppa.

- 1 pork coppa, trimmed and weighed**
(+/- 1 kg / 2.2 pounds)
- 3 percent kosher salt**
- 0.25 percent pink salt #1**
(Instacure #1, DQ curing salt #1)
- 5 percent koji, ground in a food processor or mortar and pestle**
- Spice mix (14 g black pepper; 2 large sprigs fresh thyme or savory; 6 g fennel seed; 1 bay leaf; 7 g aleppo chili flakes; 3 cloves garlic, smashed)**

In a large bowl, measure out and mix all the ingredients above except for the coppa into what constitutes the cure. Rub the cure onto all surfaces of the meat, massaging it lightly, using the salt as an abrasive to help get the koji equally distributed on the meat. Tightly wrap or vacuum-seal the meat. Let it cure in the fridge for 5 to 6 days, depending on size. Rinse the cure off under cold water and dry the meat. Pack into beef bung casings or wrap in cheesecloth, and tie the meat tightly. If you're using bung casings, poke holes with a small tack to allow moisture to leave the meat. Hang in either a curing chamber, a cool room, or the fridge until the meat has lost 30 to 40 percent of its initial weight.

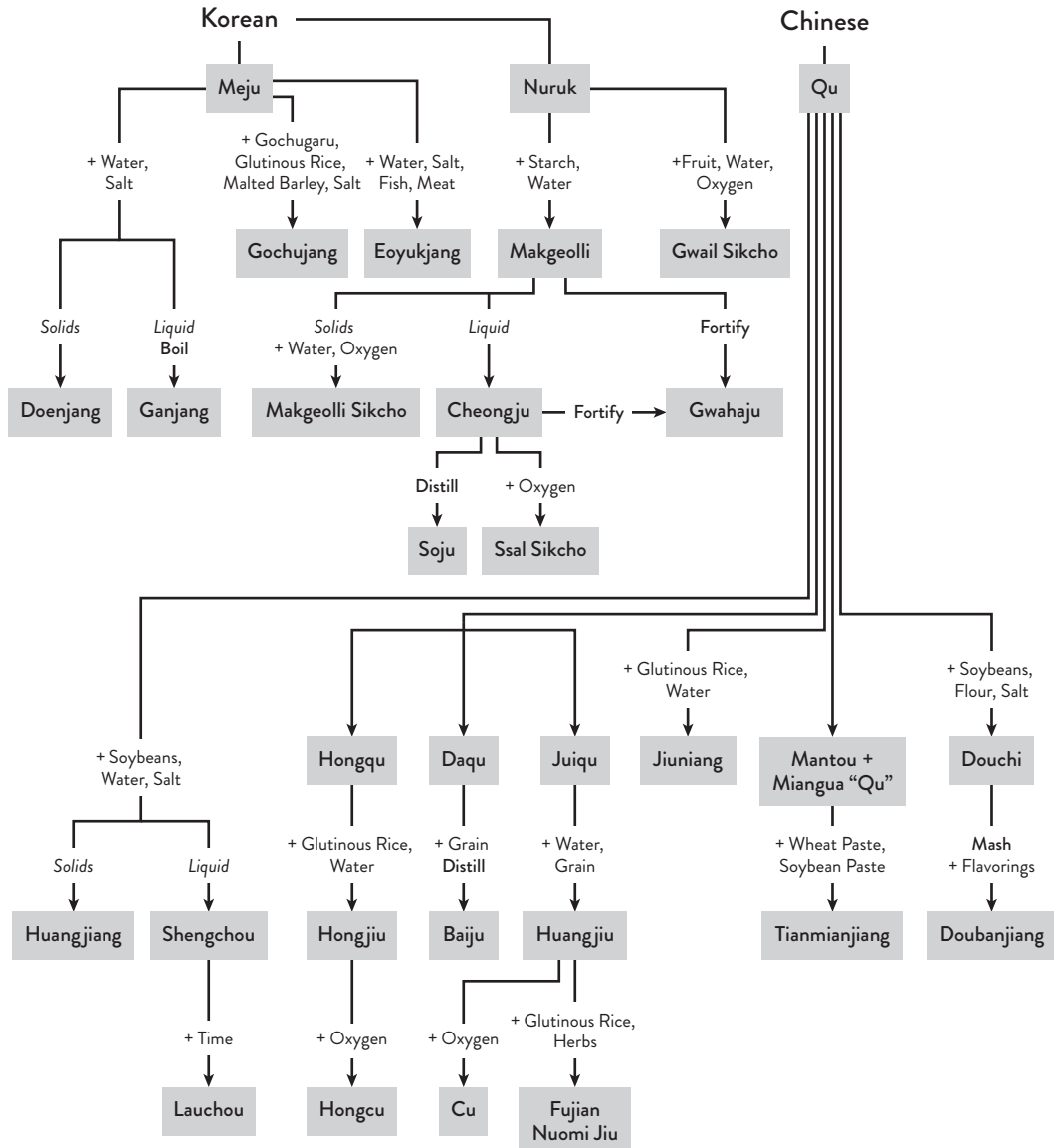
The koji-cured coppa is a delicious cured meat, with elevated umami and a deepened flavor with trace notes of koji and slight sweetness. The fat melts in your mouth more so than a traditional cure. The texture tends to be slightly softer, but you can adjust that by drying out the meat closer to 40 percent moisture loss if you prefer a firmer end product.

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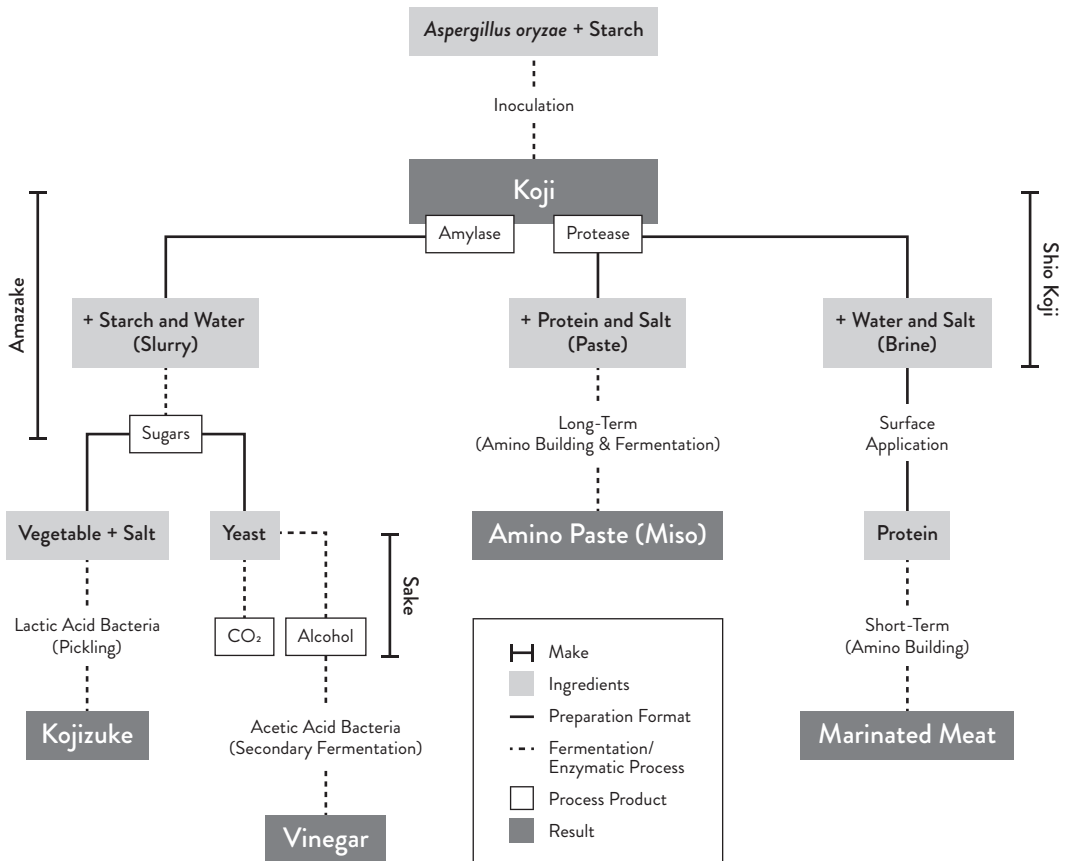


Map of traditional makes that use *Aspergillus oryzae*. In Japan, koji is primarily driven by this microbe. However, in China and Korea, it's only a component in their respective starters: qu, meju, and nuruk. This flow chart is the result of Sarah and Isaiah of White Rose Miso having the

CREATING A COMMON KOJI LANGUAGE

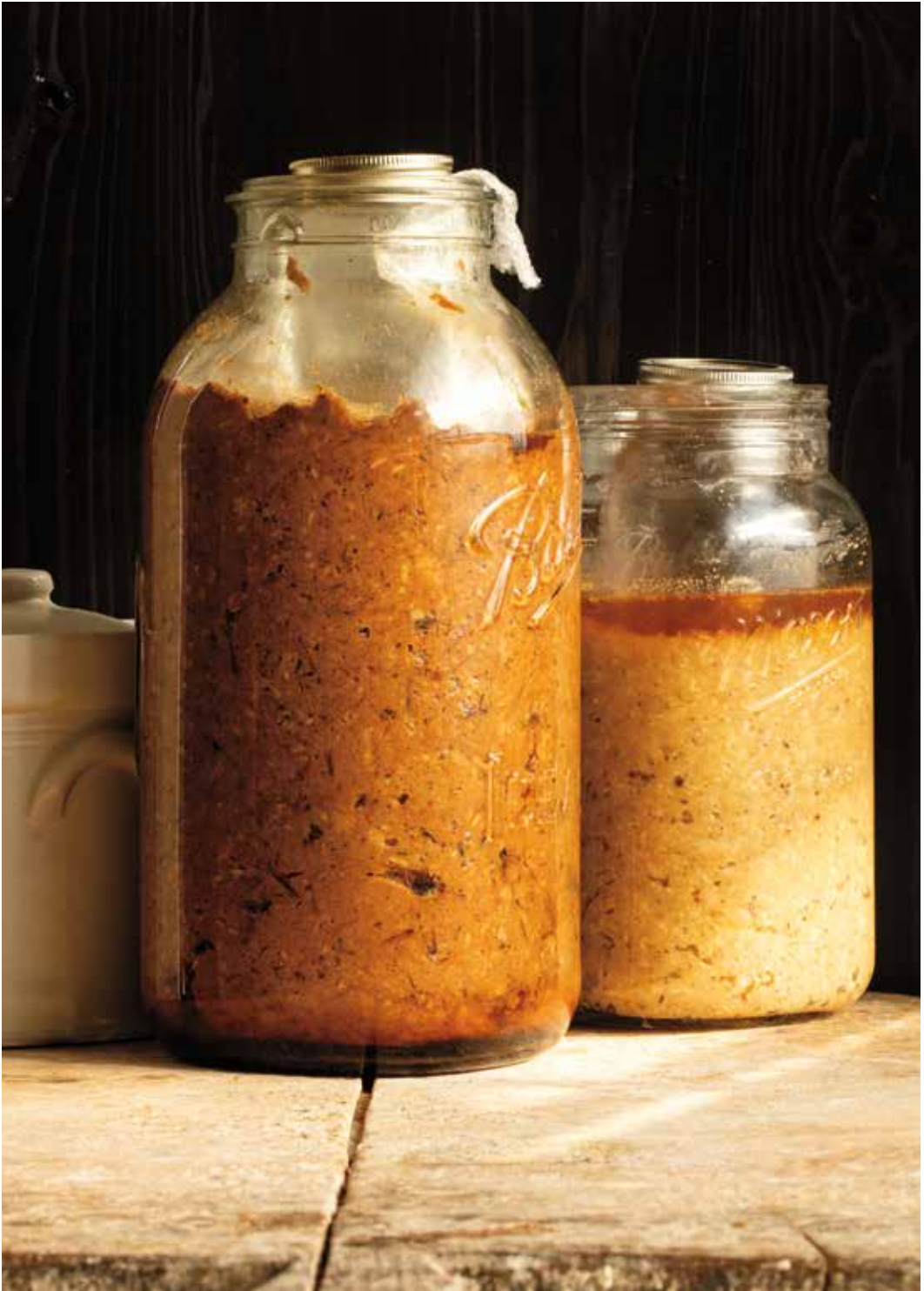


THE FLAVOR-MAKING ROAD MAP



Master koji applications map tying all of the major makes and driving factors together. *Based on a flow chart illustration by Matthew Claudel.*

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An assortment of amino pastes in jars. *Photo by Peter Larson.*

WHAT IS KOJI?



Charcuterie: koji-cultured beef rib eye, amazake coppa, and amazake mettwurst. *Photo by Peter Larson.*

Koji Alchemy is the first book devoted to processes, concepts, and recipes for fermenting and culturing foods with koji, the microbe behind the delicious, umami flavors of soy sauce, miso, mirin, and so many of the ingredients that underpin Japanese cuisine

America's Test Kitchen recently called koji "one of the coolest, most functional ingredients out there," and with *Koji Alchemy*, chefs Jeremy Umansky and Rich Shih—collectively considered to be the most practical, experienced, generous educators on the culinary power of this unique ingredient—deliver a comprehensive look at modern koji use around the world. Using it to rapidly age charcuterie, cheese, and other ferments, they are taking the magic of koji to the next level and revolutionizing the creation of fermented foods and flavor profiles for both professional and home cooks.

Koji Alchemy also includes:

- A foreword by best-selling author Sandor Katz (*The Art of Fermentation*)
- Cutting-edge techniques on koji growing and curing
- Over 35 recipes for sauces, pastes, ferments, and alcohol, including stand-outs like Popcorn Koji, Roasted Entire Squash Miso, Korean Makgeolli, Amazake Rye Bread, and more

"Use this book as the sounding board for your most imaginative gastronomic innovations."

—Rich Shih and Jeremy Umansky

RICH SHIH is one of the leading culinary explorers of koji and miso in the United States and an in-demand food preservation consultant. He is also the Exhibit Engineer for the Museum of Food and Drink (MOFAD) based in New York City. Find out more on his blog, *Our Cook Quest*.

JEREMY UMANSKY is a chef/owner of Larder: A Curated Delicatessen & Bakery in Cleveland, Ohio, nominated by the James Beard Foundation as the Best New Restaurant in America in 2019. He has been featured in numerous publications including *Bon Appetit* and *Saveur* and was named "The Deli Prophet" by *Food & Wine* in the March 2019 Makers Issue.

For More Information: ChelseaGreen.com/product/koji-alchemy

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