

NERDBAKER 2

**TALES FROM THE
YEAST INDIES**



CHRISTOPHER TAN

TALES FROM THE
YEAST INDIES

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EPIGRAM



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Introduction

WHEN MY book *NerdBaker* came out back in 2015, *The Great British Bake Off* and its global spinoffs had yet to air (which sounds crazy, given their omnipresence now), sourdough bread in Singaporean bakeries was barely nascent, and locals were more occupied with Korean fried chicken and bingsu, gourmet burgers and blankets of salted egg yolk on everything than with baking. No matter, I thought—I was also into “world music” and wide-legged pants way before the rest of the hemisphere, let’s just give it time.

Subsequently I finished gestating my next project, *The Way of Kueh*, which birthed with many blessings and much bonhomie at the end of 2019. In February 2020, I hopped over to Penang to launch the book there with my Penangite kueh sifus. It was a happy time, the culmination of a years-long quest to do justice to kueh culture.

Then in March 2020, the world stopped, and we all went indoors to bake.

This post-partum confinement was, to be honest, not the kind of rest that I had planned to take after completing such a mammoth project. What it did do—as happened for so many of us—was drive me back to my oven. Not that I ever wandered far from it, but after four years of kuehcentricity, I felt that it was fitting for me to spend a while with my first love.

Even more aptly, it was sourdough, my former nemesis, that restarted my baking engines (read about that on pg 183). It was a bumpy reboot, to be sure. Many of the things treated as givens by sourdough pundits—heavy cast iron vessels, a capacious fridge, freshly-milled locally-sourced flours, long and power-hungry oven preheats—were beyond my reach. Blessedly, with perseverance and some cogent tips from wise colleagues, I realised that none of these are strictly necessary for making good bread. The sourdough recipes in this book I therefore dedicate to every baker who has felt as daunted as I once did: take heart, if I can do it, you can do it.

And on I baked, and baked some more. Reflexes awakened, muscle memories resurfaced. I found that years of focusing on kuehs had improved my dough acumen, heightening my sensitivity to the texture and behaviour of starches. I connected

online with many of the readers of my books, which was, and is, incredibly sustaining and stimulating. Seeing how bakers around the world fellowshipped remotely, sharing and exchanging tips, recipes and above all *stories* with passion and fervour in lieu of physical proximity, I saw the echo and affirmation of *NerdBaker’s* main theme—how the cross-cultural pollination of culinary ideas and creativity can give rise to beautiful things, over centuries or within a lifetime, or an afternoon.

It also made abundantly clear to me how the very best bakers, together with the truly inspired and meaningful food that they make—whom I call the “yeast indies”—possess two virtues. Firstly, a deep devotion to and rootedness in community, and secondly, an indefatigably independent creative spirit. No one bakes alone (hey, that’s almost *Sondheim*), or only for themselves, even if no one else is in the room; the motions they make, the steps they follow, place them within a continuity of knowledge and praxis laid down by bakers eons ago. The personal touches they add to that ever-flowing river enrich and broaden it in a unique way.





This book is my witness to what I learned during the “Indoor Years”, and how it has made me a nerdier nerd and a better baker.

This is how I social distance.

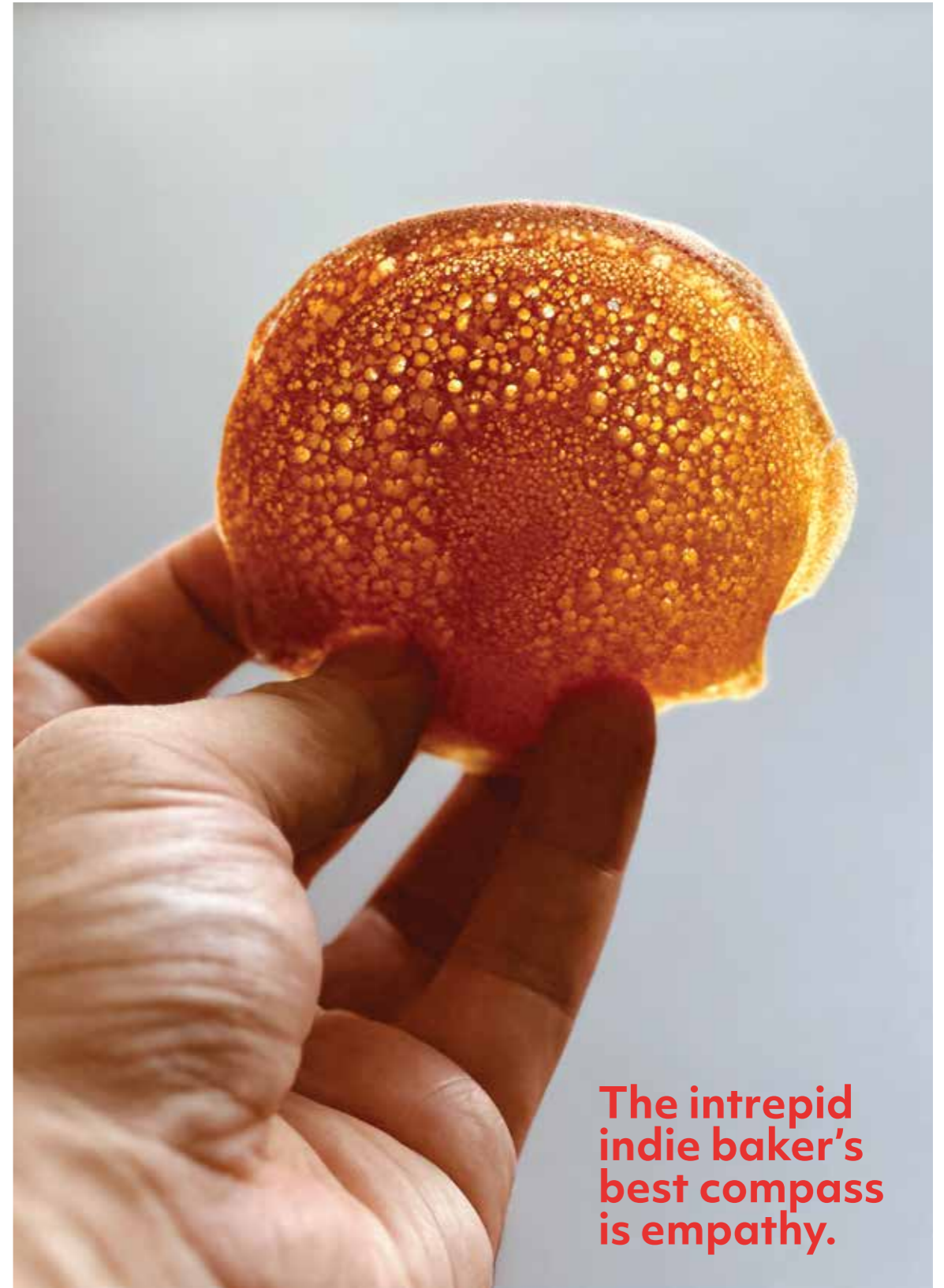
And baking with ferments—maybe especially the pesky ones—makes you even more alive to how collaborative an art it is. Grappling with a mass of dough, trying to apprehend its smell and feel and inner life, my intuition seeks to connect not just with my own wants for it, but also with the intention and skill of the grain farmer and flour miller, and with the mood of the microbes whose benedictive behaviour I solicit. Sharing the results of our collab and the tale of its making with other people completes the circle, returning the nourishment reaped to the common-wealth (in the truest sense of that word) that made it possible.

So, this book is my witness to what I learned during the “Indoor Years”, and how it has made me a nerdier nerd and a better baker. My musings on these things (tagged as NB, for NerdBaker, or nota bene for you lawyers and scribes) are scattered through the following pages like olives in a focaccia, as eye-rests among the recipes. As for the latter, my personal baking idiom has an

unconventional latitude from the youth I (mis) spent in both Singapore and the UK, and the adulting I’ve since done while travelling through other countries and cultures. Hence, rather than sharing recipes for classics already incarnated countless times on pages real and virtual, I hope to regale you with tastes, textures and ideas you may not have met before, all inspired by yeasties and beasties.

So instead of bagels, there are Fujian kompia; instead of doughnuts, hum chin pang and Mangalore buns; instead of overwrought pastry laminations, a bumbubaumbullar. My nerdity contains multitudes, so you will find stove-baked, fried and steamed items alongside oven-baked ones. Some recognisable destinations I have reached via new byways, hence a sourdough ginger cake, bababkas, tando. Where my recipes do tread established paths, I jive along their grooves with steps and rhythms all my own.

Come, dance with me through the yeast indies.



The intrepid indie baker’s best compass is empathy.



Ingredient Guide

WHEAT FLOURS

Milled from wheat grains. I only use unbleached wheat flour, save for the few instances where bleached cake flour (see below) is warranted. Look for brands without added potassium bromate, a “dough improver” banned in many countries for potential health risks. Keep all flours cool and dry. When you choose wheat flours for recipes, always match the specified protein level for the optimum results. To help you do so, I have specified my preferred flour types in the Notes section of each recipe.

Bread flour with 12 to 13% protein is fundamental. Standard supermarket bread flours can vary widely in performance, as we all found out during the flour shortages of the past few years; it’s worth paying a little more for better quality.

Japanese bread flours (kyorikiko) have 12 to 14% protein and are typically very fine, fairly thirsty (able to soak up more water) and can form resilient gluten, making them ideal for shokupan and buns.

High-protein bread flour is ideal for breads requiring a strong structure for an especially bouncy or airy crumb, or to support lots of fat and sugar. I hunt down Canadian hard wheat flour with 14 to 15% protein and no added malt at gourmet supermarkets and baking stores.

Italian 00 bread flour optimised for long ferments yields doughs whose balance of extensibility and elasticity (pg 14) is great for pizza but also for layered and shaped breads. As do many bakers around the world, I like Caputo brand Cuoco (or Chef) 00 flour.

“Artisan” bread flour destined for sourdough, rustic and crusty breads is typically formulated with strong gluten (12 to 14% protein) and may have added malt (pg 14) for livelier fermentation.

Plain (all purpose) flour can vary a lot in protein content among sources, brands and countries. The brands I use hover around 11%.

Pastry flour—not a standardised industry name—has a moderate 9 to 10% protein content, suited to (surprise!) pastries. It may be milled finer than plain flour.

Cake flour with around 8% protein may be bleached or unbleached: the former makes lighter

and spongier cakes, but its higher pH must be accounted for, and it can leave an aftertaste.

Bao flour or “Hong Kong flour” is extra-fine flour with 7 to 8% protein, meant for steamed bao. It is often bleached, but I prefer it unbleached, such as Prima brand.

Wholewheat flour (a.k.a. wholemeal or whole grain flour, depending where you are) includes the bran, endosperm and germ portions of the wheat kernel and is hence higher in fibre and nutrients than white flours, which are mostly or all endosperm-derived. It is usually available with different protein levels—check the fine print.

Atta, Indian stoneground wholewheat flour, is finer and more extensible than Western wholewheat flour, being optimised for chapatis, rotis and other flatbreads. I use it when I want wheaty flavour but not a nubbly mouthfeel.

Durum wheat is loaded with protein that makes pasta al dente, but its low extensibility requires careful treatment in bread dough—it will tear rather than stretch unless very carefully developed. I mainly use these formats: medium-coarse **semolina**, which Italian cooks call semola di grana duro and Indian cooks call suji (sugee) or rawa; and Italian **“semola rimacinata”**, semolina “re-milled” into silky-fine flour.

OPPOSITE PAGE:

On the left, selected **non-wheat items and starches**. Left column, from the top: pulut hitam (black glutinous rice), dark rye flour, light rye flour, Thai rice flour, potato starch, cornstarch. Right column, from the top: rolled oats, wholegrain spelt flour, light spelt flour (some bran removed), Thai glutinous rice flour, tapioca starch, wheat starch.

On the right, assorted **wheat flours**. Left column, from the top: Western wholewheat flour, Indian atta wholewheat flour, Canadian high-protein bread flour, Japanese bread flour, Italian 00 bread flour, unbleached Hong Kong flour for bao. Right column, from the top: Indian suji, Italian semola, Italian semola rimacinata, plain flour, pastry flour, bleached cake flour.

NON-WHEAT FLOURS & STARCHES

Non-wheat flours: I use these three most often. I love the soigné flavour of wholegrain **rye flour**, which varies from light to dark. Darker flours contain more bran and germ, and thus more flavour and fibre. **Spelt flour** has a cheerful, nutty taste and weaker gluten than wheat, making doughs softer and more extensible: I prefer wholegrain spelt flour with about 12% protein. I make my own coarse **oat flour** by whizzing rolled oats or oatmeal in a blender.

The **rice flour** and **glutinous rice flour** I use are wet-milled flours from Thailand. Older rice flour makes for springier textures in some kuehs and appams, so I sometimes store it in a cool place for a few months before using it.

Tapioca starch grants soft, elastic textures and shiny, translucent looks to kuehs and appams. An all-purpose thickener, **cornstarch** also yields fine-grained, fragile textures in cakes and cookies. **Potato starch** is a strong binder, thickens quickly, and gives cakes and breads more open, fluffy and tender textures. Pure white **wheat starch** extracted from flour gives dim sum and kuehs translucent finishes and firm, springy textures; it can be added to flour to lower its overall protein content. Look for all of these at Asian supermarkets and dry goods and baking supply stores.

SWEETENERS

Refined white sugar has the most neutral sweetness; **unrefined sugars** are more interesting as they retain some of the characters of their source materials.

Icing sugar (confectioner's sugar) contains cornstarch to absorb humidity: organic icing sugar often uses tapioca starch instead.

So-called "brown sugar" is usually just white sugar tinted with molasses—true cane-derived **unrefined muscovado sugar** is much more flavourful.

Palm sugar, reduced and crystallised palm flower sap, combines earthy sweetness with mineral, salty, umami, acidic and bitter flavour notes. It can derive from coconut, arenga, nipa or palmyra (toddy) palms. It ranges texturally from moist and scoopable to dry blocks: for the latter, a little white sugar is usually added to aid crystallisation, but too much of it makes for a hard, bland product.

Palmyra flower sap, unreduced but pasteurised—i.e. unfermented toddy (pg 31)—

tastes like fresh corn and cooked rice and is sold as a sweet drink at Thai grocery stores. Yeast loves it.

Syrups like molasses, treacle, golden syrup, honey and maple syrup give baked goods browner crusts and moister textures.

DAIRY & FATS

I like European-style cultured **butters** with 81 to 83% fat, for their complex flavours. I use **fresh milk** with around 4% fat content and **whipping cream** with 32 to 33% fat. As for fermented dairy, I use regular **yoghurt** with 3 to 4% fat, **Greek yoghurt** with 9 to 10% fat, **sour cream** with 30 to 35% fat, and **mascarpone cheese** with around 40% fat.

I use full-cream **sweetened condensed milk** with 8% fat and around 50% sugar, and **full-cream milk powder** with 25 to 30% fat.

Hand-squeezed fresh **coconut milk and cream** have no peer, but pure coconut, additive-free UHT versions are acceptable alternatives—I like Thai brands. Coconut milk is usually 15 to 20% fat, coconut cream 22 to 26% fat.

For adding to doughs, I find **sunflower oil**, **almond oil** and **grapeseed oil** to be the most neutral-tasting. For deep-frying, I use **rice bran oil** for its high heat tolerance.

Home-rendered **lard** is the best kind: half-fill a heavy pan with finely diced pork fat, add water to half the level of the fat, cover tightly and cook over medium-low heat until most of the fat has melted; top up the water at intervals if it evaporates faster than the fat melts. When only small bits of solid residue remain, cook uncovered until all the water has evaporated, but stop before the residue browns. Ladle off the liquid lard and strain it through fine metal mesh or cloth. It will keep in a tightly sealed jar in the freezer for at least 4 months.

OTHER ESSENTIALS

Use the freshest **eggs**. That's all. *All the egg quantities specified in my recipes are for eggs weighed without their shells.*

Fruit, vegetables and herbs—likewise, fresh is best.

Buy **nuts** in small quantities and store them in the freezer. Home-ground **nut flours** taste the freshest, but ready-made ones are finer-textured.

Buy **cocoa powder** and **dried spices** in small quantities and use them up pronto.

I use non-iodised fine **sea salt**.



A selection of **unrefined sugars**. From the top left corner: slab muscovado sugar from Myanmar; coconut palm sugar blocks from Melaka; muscovado sugar from Mauritius; toddy palm sugar balls from Myanmar; leaf-wrapped arenga palm sugar from Indonesia; palmyra palm sugar balls from Myanmar; soft Thai coconut palm sugar in a tub.

CHEMICAL LEAVENERS

Baking powder is a blend of acidic and alkaline compounds. They react with each other in the presence of water and heat to generate carbon dioxide, which expands bubbles already present in a dough or batter. The acid salts may include sodium, calcium or potassium phosphates and pyrophosphates; the alkali is most commonly sodium bicarbonate. Single-acting baking powder typically has only one acid salt; double-acting has two, one fast-reacting plus one slower-reacting, to prolong the overall rising period. A buffering agent such as cornstarch is usually added to absorb ambient moisture so the powder won't react in the tub. I generally only use double-acting baking powder. See pg 127 for further info.

Baking soda is sodium bicarbonate. It makes doughs or batters more alkaline if acids are absent, or reacts with acids to leaven them.

Ammonium bicarbonate, a.k.a. baker's ammonia, is a powerful leavener traditional to both

Asian and European baking. It activates rapidly upon heating, breaking down into ammonia, carbon dioxide and water. It is hence typically used for thin items like cookies and bao skins, from which the gaseous ammonia can fully dissipate during cooking and cooling. It has many nicknames, including chow fun (Cantonese for "smelly powder") and hartshorn, as it was once derived from deer antlers.

YEASTIES & BEASTIES

Please see pgs 25, 31, 39, 157 and 181 for more about yeasts and pgs 25, 117, 177 and 182 for more about other beasts.

USEFUL EQUIVALENCIES

1 teaspoon fine sugar = 5 g
1 teaspoon fine salt = 5.6 g
1 teaspoon baking powder = 4 g
1 teaspoon instant yeast = 4 g

Equipment Guide



My most vintage loaf pan is perhaps 50 years old, though its shape dates back to at least the 1800s. It turns out classic British “milk loaf”, a.k.a. “tank loaf” or “pipe loaf” in Australia, or “casino loaf” in the Netherlands. These soft-crumbed bread bolsters have vanished in Singapore but survive in some of Malaysia’s bakeries.

These baking tools I presume most kitchens now have, and hence are givens for all recipes: a stove, an oven, a stand mixer, baking sheets, prep bowls, airtight food containers, a rolling pin, baking paper, dough scrapers, pastry brushes, spatulas, a mister for spraying water, pots and pans, cooling racks. Beyond these, specific items needed for each recipe are listed in their “Equipment” sections.

Like many modern **ovens**, my oven’s different modes allow me to independently control and combine a fan, separate heating elements in the ceiling and floor and around the fan, and a grill element. Fancy steam-and-bake combination ovens are lovely, but overload both my budget and non-techie brain.

I use a **stand mixer** for any dough requiring more than a brief mixing. (I’m no spring chicken: I choose my battles.) I remain in mourning for my 1970s thickset Kenwood Major, which during a moment’s inattention walked and then leapt off my counter mid-knead, and perished. Currently, I use a Teddy Varimixer, which has high torque and is comparatively quiet (see pg 16 for more). If you bake frequently or in large batches, a heavy-duty semi-pro or pro mixer is worth investing in.

I favour an Indian **blender** (often nicknamed a “mixie”) to puree and process foods, for its high horsepower, durability and easy-to-clean stainless steel goblets.

A **digital weighing scale** measuring down to 0.1 gram satisfies my level of fussbudgetiness. It is the most accurate tool for ingredients like instant yeast, salt, spices and chemical leaveners.

For some ingredients, I use stainless steel **measuring spoons** in 1 tbsp, 1/2 tbsp, 1 tsp, 1/2 tsp, 1/3 tsp, 1/4 tsp, 1/8 tsp and 1/16 tsp sizes. By filling the 1/16 tsp measure half-full, I measure 1/32 tsp.

I (infrequently) use an instant-read **probe thermometer** (photo on pg 163) to check the temperature of things like deep-frying oil, sugar syrup and Tandoro crumb (pg 226).

Marble, wood or bamboo cutting boards only need a very light veil of flour or oil to roll and shape dough on without sticking.

I have 3-cm thick wooden **rolling pins** for general use, plus shorter, slimmer ones for steamed bao dough and pastry work. A grooved or grid-

embossed rolling pin thoroughly deflates doughs for an even crumb and can roll out laminated doughs more consistently. A heavy marble pin can tackle dense or laminated doughs which need to stay cool.

Stainless steel mixing bowls are a staple, as are **spatulas** with rigid cores clad in seamless silicone and **pastry brushes** with silicone or natural bristles.

Plastic or silicone **dough scrapers** are best for cutting raw dough. I slash loaves before baking with razor blades mounted on a **bread lame**, or with a small, extremely sharp **knife**.

I like thick aluminium **baking sheets** with rolled edges to prevent warping. Perforated sheets allow slightly better circulation of hot air. I always line sheets with **baking paper**, most cost-effectively purchased from baking supply shops.

Great for toting fragile cake layers, a wide metal **cake lifter** with a sturdy handle is also superb at sliding breads onto or off hot baking trays.

Several loaf recipes in this book are baked in 2-litre **pullman loaf pans**, a widely available capacity: mine are 20 by 10 by 10 cm, with slightly outward-leaning walls—these turn out loaves whose sides contract to perfect verticals as they cool. Heavy pans brown crusts more evenly.

For my bababkas (pg 59), I use **loaf pans** also around 2 litres in capacity, but shallower and longer than pullmans—26 to 28 cm long, 10 cm wide and 7 to 8 cm deep—as they yield twistier, prettier loaves. Cake-wise, I have cast aluminium **decorative loaf pans** for gettin’ fancy widdit.

My square, round and oblong **cake pans** are all aluminium or enamelled steel, as are the **ring/tube/bundt pans** which are ever my fatal obsession. The latter lend great support and permit efficient air circulation for a rapid, even bake.

Reuseable **covers** will shield proofing dough or items from dry or draughty air. I bulk proof dough in lidded airtight stainless steel, glass or enamel containers. To cover shaped buns on baking sheets, I use washable heavy-duty aluminium foil food trays, large and deep enough to stay well away from the rising dough. Inverted large prep bowls or stretchy plastic shower caps can cover most bowls or pans.

I use sturdy cast iron or non-stick **skillets** and

frying pans for stove-cooking flatbreads and kuehs, and to toast dry ingredients like oats and semolina.

Appam pans—basically small woks—come in several materials, from metal to clay. I have: a 20-cm diameter Indian cast iron appa chatti; a 25-cm Indian non-stick chatti; a Thai 22-cm cast aluminium apam pan (pg 143); these are all shallowly curved, like contact lenses. I also have a deeper, hemispherical 22-cm Sri Lankan-style steel hopper pan (pg 204).

Multi-welled pans, traditional to many cultures, are sold at physical and online Indonesian, Indian and Malaysian stores. I use these most often:

- Malay/Indonesian **apom pans** (below, left) with wells 7.5 cm across and 1 cm deep (suited to serabi telur, mini vellayappam, mini apom lenggang), traditionally cast in brass or aluminium (shown here), now sometimes with non-stick finishes. Closest alternative: a Western plett pancake or blini pan.

• a heavy Indonesian cast aluminium **kue bika ambon/kue lumpur pan** (below, right) with wells 7 cm across and 3 cm deep (suited to mini bika ambon, crumpets, mini bolu caramel). The wells have flat bases with sharp or curved bottom edges.

Closest alternatives: an egg pan or paniyaram pan (see right), a large aebleskiver (Danish pancake ball) pan.

- a non-stick **"egg pan"** (right, top), widely sold and touted online for frying eggs, pancakes and burgers. It has flat-based wells 8 cm across and



2 cm deep (suited to crumpets, mini martabak manis, mini bika ambon). Vintage cast iron pans of this shape can be found online.

- Indian **paniyaram pans** with hemispherical wells around 4 to 5 cm across and 2 to 2.5 cm deep, made of aluminium, brass, cast iron, steel or (in India) stone. Non-stick ones exist now too (pg 197). Practically identical alternatives: pans for Indonesian kue cubit, Thai kanom krok, Japanese takoyaki or Western aebleskivers.



Do I have too many loaf pans?
I think I have too many loaf pans.

BEFORE
You Do
Anything
Else, READ
This Crucial
Note



Durian increases your internal heat. So does working in my tropical kitchen.

WE ARE all connected now: a recipe released into the world might be simultaneously attempted in Helsinki or Sulawesi or Montevideo. Hence, recipe creators should always describe their ambient working conditions, so that readers can anticipate any adjustments needed to suit their own situation.

So, I developed and tested all the recipes in this book in my kitchen in Singapore, at sea level and a mere 1° north of the Equator, where:

- The daytime room temperature ranges from 27°C (considered “cool”) to 34°C (80°F to 93°F).
- The night-time room temperature ranges from 25°C to 30°C (77°F to 86°F).
- The humidity ranges from 70% to 90%.

This means that:

- I need no warmers to hustle the yeast along (my “proofing box” is...a box).

- I know that if I chill the water and/or the other wet ingredients and fat, the dough temperature stays at around 25 to 27°C, optimum for proofing, so I rarely bother with a thermometer.
- My sourdough starter lives in my fridge, where I also cold-retard my sourdough loaves (pg 213).
- The humidity slows down the staling of baked breads, but increases the chances of spoilage.

Hence:

- If your kitchen is cooler than mine, expect longer proofing times.
- If your air is drier than mine, cover everything more tightly, or humidify your kitchen with an open pot of simmering water, and be prepared to tweak dough hydration.

TERMS

Amylase: a class of enzymes which convert starches into sugars, a process called amylolysis. (Amylases in human saliva help us digest starchy foods.) Fermentation starters are called “amylolytic” if their microbial mix is tuned for high amylase secretion to free sugars that yeasts can gobble: starters optimised for making rice wine additionally contain microbes which can then ferment those sugars into alcohol.

Autolyse: a chemistry term meaning to inflict or undergo autolysis, the process of enzymatic breakdown. Bakers, however, use “autolyse” to refer to a mix of some or all the flour in a recipe with some or all of the liquid, stirred up and left to sit in advance of the dough’s final mixing. During this time, the flour evenly hydrates and bran particles soften: amylases in the flour start breaking down starches into sugars, which feed the yeast, boost flavour and aid crust browning; proteases break down some proteins, enhancing dough extensibility; gluten networks start to form and strengthen, enhancing dough elasticity. An autolyse reduces the total mixing time needed for dough development, and makes higher hydration doughs more manageable. An autolyse with added salt (which slows the enzyme activity) may be dubbed a **saltolyse**. One with added yeast or starter may be called a **fermentolyse**.

Baker’s percentage: a way of expressing each ingredient quantity in a recipe as a percentage of the total flour

weight. While it aids concise formula notation, it can befuddle novice or occasional bakers, so I have not used it in this book. #1YKYK.

Bench rest: a short relaxation period allowed to a dough before it is shaped.

Bulk proof: a.k.a. bulk fermentation, the first major proofing phase of a fully mixed dough.

Cold retard: the practice of chilling dough to slow down fermentation and develop flavour.

Dough development: the transformation of ingredients into a proper dough during the mixing process, during which gluten molecules interlink into a strong network that can trap the gases exhaled by the growing yeasts. Proper mixing develops dough from a shaggy, uneven and dense lump into a cohesive, smooth and elastic mass.

Elasticity: a dough’s ability to snap back to its original shape after being stretched out.

Extensibility: a dough’s ability to be stretched into thin layers or long shapes without snapping back.

Final proof: the last major proofing period of a dough before it is cooked.

Gluten: a network of interlinked protein molecules which traps gas bubbles and then solidifies during baking, creating crumb structure. Many grains contain gluten-forming proteins. Wheat

is especially rich in two types of these, glutenins and gliadins, which together form strong networks. If all the starch is washed out of a well-developed dough, the spongy, loofah-like mesh left behind is almost pure gluten: Chinese vegetarian cuisine manipulates this into different “mock meats”.

Hydration: as a verb, the absorption of liquid by the flour in a dough. As a noun, it also means how much water a dough contains, usually expressed as a baker’s percentage.

Leaven: a preferment made with sourdough starter, flour, liquid and sometimes other ingredients. Often called (by people fancier than I am) by its French name, “levain”.

Oven spring: the rapid rise in volume which occurs during a bake.

Malt: to malt a grain, you soak it so it germinates and sprouts, its amylases turning its stored starch into sugars, principally maltose. The grains are then dried. Low-temperature drying leaves the enzymes intact, resulting in **diastatic malt**: this is often added to “artisan” bread flours (pg 5) to boost the yeast activity of doughs made from them. High-temperature drying destroys the enzymes, yielding **non-diastatic malt**—if you’ve had Horlicks, you’ve tasted this. Yeasts go mad for maltose, so both kinds of malt increase a dough’s fermentation rate, crust browning and crumb softness. Barley is the most commonly malted grain, followed by wheat. English malted bread

flour blends may contain (non-diastatic) malted grain flakes.

Oxidation: oxygen in the air will react with gluten molecules in bread dough (or much more slowly in dry flour). A moderate amount of oxidation strengthens gluten. Too much oxidation, from overmixing or over-proofing, damages the carotenoid compounds which give flour its colour and flavour, yielding pale, bland bread.

Pâte fermentée: a.k.a. “old dough”, a French preferment—traditionally a piece saved from a previous day’s dough batch to add to a new batch. Nowadays it can sometimes mean a firm, long-rested preferment with the same or similar hydration to the final dough, plus a little salt.

Preferment: a mix of flour, liquid and yeast (and sometimes other ingredients) stirred up in advance of dough mixing, to jumpstart yeast activity and to acquire some of the benefits of an autolyse. A runny or loose preferment may be called a **poolish**. A stiffer, dough-like preferment may be called a **biga**; a preferment texturally between these two may be called a **sponge**. I say “may be” as all three terms are often used loosely and with some overlap.

Protease: a class of enzymes which breaks down protein molecules into shorter amino acid chains or single amino acids, a process called proteolysis. All flours contain proteases in varying amounts. Malted grain (pg 14), soakers (see right), sourdough starters and koji (pg 117) all abound in

proteases. Proteases degrade gluten networks in bread dough, increasing extensibility and freeing flavoursome amino acids. Salt inhibits proteolysis.

Retrogradation: the realignment and recrystallisation of molecules in cooked starch as it cools and ages, resulting in a firmer texture. This is what causes bread-staling and kueh-stiffening. Amylose (see below) retrogrades faster than amylopectin.

Soaker: grains and/or seeds and/or whole-grain flours, mixed with water and salt and left to sit and hydrate in advance of being added to a dough mix. If mixed into a dough while dry and unsoaked, these fibre-rich ingredients compete with the flour to absorb water, and their particles’ sharp edges can disrupt gluten networks, impeding dough development.

Starch: starches are polymeric carbohydrates, a.k.a. polysaccharides, which serve as plants’ energy stores, as they can be broken down into sugars. The two main kinds of starch molecules are amylose and amylopectin; their textural differences can be appreciated if you think about how regular long grain rice—high in amylose—differs in mouthfeel from glutinous rice, which is high in amylopectin.

Tangzhong: a.k.a. yukone in Japanese. A mix of liquid and flour or other starch, often in a 5:1 weight ratio, cooked into a paste, during which the starch granules absorb moisture, swell

and burst, releasing starch molecules which thicken and bind the mixture, a process called **gelatinisation**. This **pregelatinised starch** makes breads more moist, soft, and slower to stale. Tangzhong was an established commercial technique before Chinese-language baking books popularised it among home bakers in the early 2000s, hence its Mandarin moniker. Other cuisines have similar techniques, e.g. kappi (pg 147). **To make a tangzhong**, slowly whisk the sifted dry ingredients into the liquids in a small pan, then whisk the mixture constantly over medium-low heat until it thickens to a creamy (or otherwise specified) texture. Scrape into a bowl, cover to prevent moisture loss and skin formation, and let it cool.



A tangzhong.

Windowpane: a dough with sufficiently well-developed gluten can be stretched into a delicate membrane between your fingers, potentially thin enough to see (dimly) through—hence “windowpane” (pg 17). Not every dough can or should reach

this degree of development, which is chiefly mandated for breads which need strong structure to trap lots of air (e.g. shokupan). A weak windowpane will tear before it gets very thin; a moderate windowpane will stretch thinner and will rip with raggedly-edged holes; a strong windowpane will be thinner yet and eventually rip with smooth-edged round holes (see photo on pg 228). En route to windowpane stage, as the mixer whirls, the dough may form what I call “gluten skeins”, momentarily stretching out between the hook and the bowl sides in thin sheets.

Yudane: simply boiling water stirred into dry flour, this is a Japanese-named format of pregelatinised starch, similar to the German brühstück or Russian zavarka used in rye breads. Equal weights of water and flour are typical, but I use slightly more water than flour for a softer yudane which blends more easily into the final dough. **To make a yudane,** sift the dry ingredients into a bowl, place the bowl on a weighing scale and zero the scale. Pour in the desired weight of boiling water, and immediately mix with a spatula to make a sticky mass. Fold it over on itself just a few times to even it out and ensure that all the flour is moistened. Wrap it in plastic wrap, or pack it into a vessel just big enough to contain it with minimal airspace, and cover airtight. Chill for the specified time.

TECHNIQUES, PHASES & PROCESSES

MIXING

Yes, **kneading by hand** is fun. Yes, it schools you in the subtleties of assessing dough texture. Yes, it sets novice bakers on a steep but worthy learning curve. NO, I do not want to do it for most of my doughs, especially soft or enriched ones needing intensive development, because in tropical conditions, it gets very messy very fast.

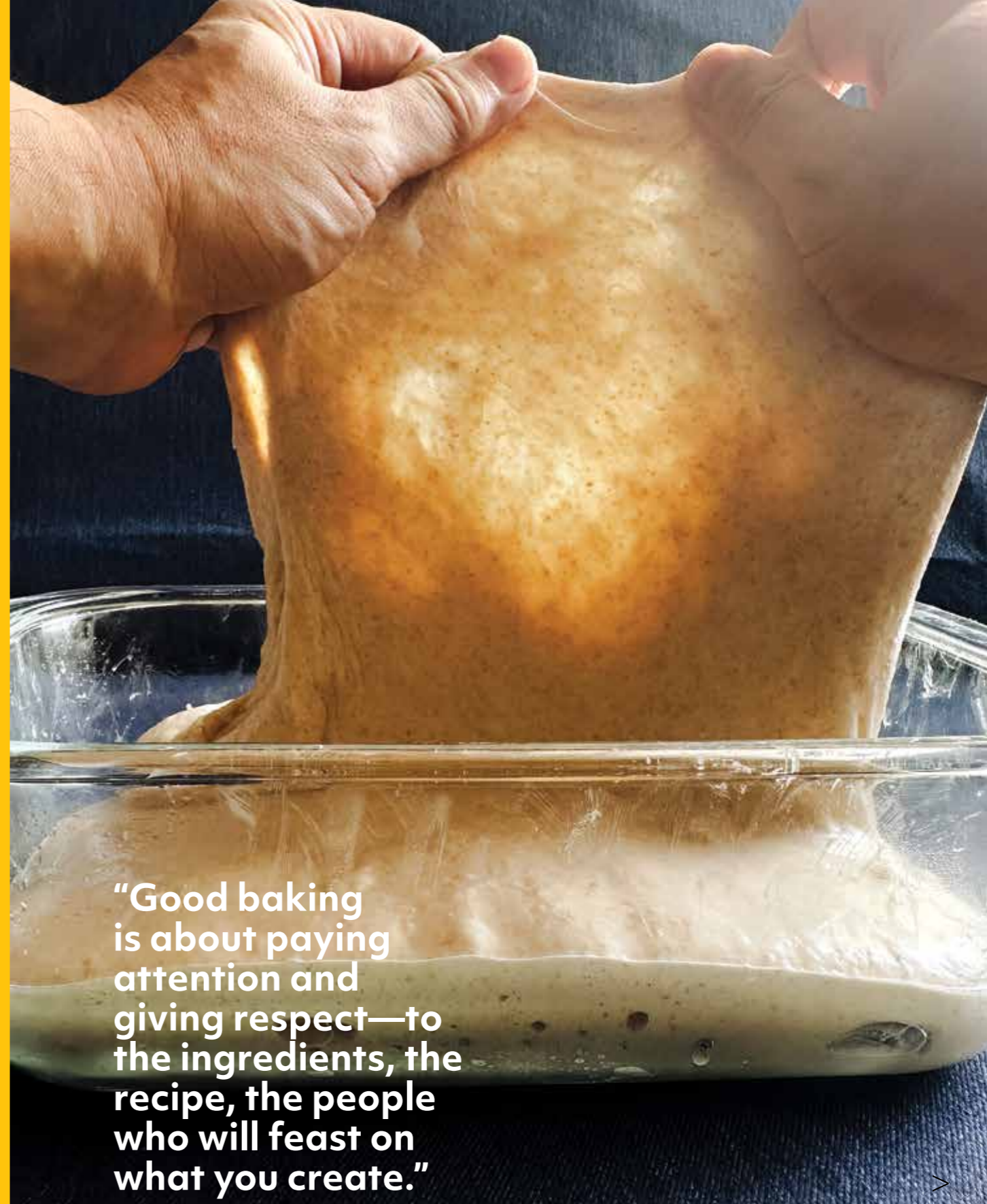
Mixing by machine. For full transparency, the table below shows how the mixer speed settings I cite in my recipes translate to the actual machines which I use. I almost never go above medium speed when mixing bread dough: higher settings are for creaming butter, whipping eggs, etc.

Mixing and resting. As I develop a dough, I alternate

short mixing phases with short rests, for several reasons. It puts less stress on your dough and your mixer motor: the gluten regroups and strengthens as it rests, which reduces the total needed mixing time overall. Less mixing means less oxidation and better flavour, and less friction for a cooler dough, very significant in hot weather. During rests, I detach the dough hook from the mixer and let it nestle in the dough, then reattach it for the next mix phase.

Stretching and folding by hand develops dough gently: grab an edge of the dough in the bowl, stretch it upwards as far as it can go, then fold it back down over the rest of the dough mass. Rotate the bowl 90 degrees, and repeat. When you have rotated back to your starting point, you have made one full pass.

	speed setting range	lowest	low	medium-low	medium
Teddy Varimixer	1 to 5, with ½ divisions	⅓	⅔ to 1	1 to 1 ⅓	2 to 2 ½
15-year-old Kenwood Chef Titanium	1 to 6	1	between 1 and 2	2	3
6-year-old Kenwood Chef XL	1 to 6	1	1 to 2	4	5 to 6
10-year-old Artisan KitchenAid	1 to 8	1	2	3 to 4	5 to 6



“Good baking is about paying attention and giving respect—to the ingredients, the recipe, the people who will feast on what you create.”



About the Author

CHRISTOPHER TAN (www.foodfella.com | @thewayofkueh on Instagram) is a writer, cooking instructor and photographer. His pen and his lens are mightier than his pancreas, but not by much. He has chronicled, commentated and kibitzed on food, culture and heritage for many publications, including Singapore's *Straits Times* broadsheet and local magazines such as *Wine & Dine*, *Appetite*, *The Peak*, *Food & Travel* and *Epicure*. His recipes have appeared in the *New York Times* and America's *Saveur* magazine. He has presented talks, demos and online videos for Singapore's National Museum, Peranakan Museum, National University and National Library, as well as the Culinary Institute of America, Paris' Le Musée Quai Branly, The Sydney International Food Festival and the Asia Society in NYC. His friends still think he should get out more. Christopher has authored and co-authored many cookbooks, most recently the award-winning *The Way of Kueh*, a paean to Singaporean kueh culture. He teaches regular baking, cooking and kueh classes at The Kitchen Society in Singapore.

"I trust no one more than Christopher to teach me about baking techniques, ingredients and customs... *NerdBaker 2: Tales from the Yeast Indies* is my most anticipated publication this year."

– Helen Goh, *Sydney Morning Herald* baking columnist and co-author of Ottolenghi's *Sweet*



WELCOME TO THE YEAST INDIES!

In this sequel to his bestselling cookbook *NerdBaker*, Christopher Tan celebrates how intrepid indie bakers and industrious microbes can together create heavenly, leaveny feasts—fermented foods and baked goods with outstanding, amazing flavours.



CHRISTOPHER TAN is an award-winning writer, photographer and educator who has trained his pen, lens and senses on matters of food and culture for over 25 years. He has authored numerous books and teaches frequent cooking classes. Many things constantly ferment in his oven, fridge and brain.

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