

Do dairy-free milk alternatives stand up to scrutiny?

When thinking about producing and enjoying best possible coffee drinking experience, it's natural to focus on the bean. But other factors also influence the overall quality and taste of your daily cup. Of these factors, the one that has the most obvious impact is the choice of milk...

For many coffee lovers, this choice comes down to simply 'full-fat' or 'skinny' (or no milk at all, of course!). But there are a significant number of coffee drinkers who require, or prefer, a dairy-free alternative. The most obvious reason for going dairy-free is to avoid aggravating the symptoms of lactose intolerance. However, people also ditch the dairy for health and animal welfare concerns, or simply because they don't like the taste of cow's milk. Not too long ago, when talking about non-dairy alternatives, it was all about soy milk. But there are now an increasing number of options available. In 2014, non-dairy made up a quarter of the new milk products on the market.

Of the available options, the most popular are soy and almond. But you can also find oat milk and other nut-based milks, as well as those made from coconut, hemp and rice.

While dairy-free milks are growing in popularity among consumers and are increasingly appearing on coffee shop menus, the use of these plant and nut-based alternatives is a contentious issue among coffee connoisseurs and professionals, with debate raging over how they impact the taste and texture of coffee. What happens when you heat milk?

When it comes to espresso and milk-based beverages, one of the most important elements is foam quality. After all, if the milk can't be steamed to the right consistency, all of that fancy latte art and those foamy milk moustaches go out the window! In order to make hot espresso and milk-based beverages, the barista introduces hot water vapour to cold milk. When performed correctly, this process produces silky, creamy milk foam that holds its texture and doesn't split or curdle when added to the hot espresso base.

The tricky part is that different types of milk have different proportions of fat, protein and carbohydrate, which means they react differently to the steaming process. When it comes to producing quality foam, the crucial component is protein. Full fat cow's milk has around 3.2% protein content, while skimmed (or 'skinny') milk has about 3.4%. Both these types of milk react well (if somewhat differently) to steaming. In comparison: Oat milk has 3% protein Soy milk has 2.7% protein Almond milk has a mere 0.4%.

Other challenges for the non-dairy alternatives

Foam quality aside, acidity in coffee can cause non-dairy milk to curdle. The coffee acts as a coagulant (or clotting agent), leaving the drinker with a lumpy mess. Let's face it; nobody likes clots in their coffee! Of course, to become an acceptable alternative to cow's milk, the non-dairy option has to compliment, not overwhelm, the flavour of the coffee. Most roasters understandably want their beans, not the milk, to be the star of the show!

To show just how hard it is to develop a suitable non-dairy alternative, last year, a group of Australian baristas got together with an allergen-free food producer to develop a range of soy and almond-based milk alternatives that react well to being steamed and poured into hot espresso.

It took them a year to come up with something they were happy with. Speaking to *The Sydney Morning Herald*, one of the baristas involved said: "I can tell you, getting almond milk not to split, or getting soy milk not to split and curdle when you add very hot coffee, is no easy task." But the Aussies aren't the only ones to take up the challenge.

Anyone who visited the recent London Coffee Festival got the chance to see a range of exhibitors showing off their non-dairy alternatives, all of which promise to be the perfect partner for coffee and offer the best possible coffee drinking experience. All of this demonstrates both the challenges and opportunities out there for the non-dairy industry and consumers. But just how do the non-dairy contenders stack up? We take a look at just three...

Soy milk

Soy milk remains the most commonly-available dairy-free alternative and the one you'll find in most coffee shops. It's a plant-based milk made from soya beans. Soy milk is free from lactose, cholesterol and saturated fat. However, the jury remains out with regards to the health benefits/risks of soy.

Texture: Soy milk has a similar protein content to milk, which means it generally stands up well to steaming and produces a nice creamy foam. As mentioned above, soy milk can curdle in hot coffee, but some brands add stabilisers to minimise this effect.

Taste: Some people (myself included) love the taste of soy milk, while others hate it. However, its distinctive taste means it will impact the taste of your coffee quite significantly. Soy milk comes in sweetened and non-sweetened varieties, which has taste (and health) implications. How the soy milk is processed also affects the quality of the milk and the intensity of its flavour.

Home brewer's tip: If you find your cold soy milk curdles when you splash it into your hot cup of coffee, try vigorously shaking the container before pouring in the milk. Also try putting the milk in before the coffee. Failing that, a good stir usually does the trick.

Almond milk

Made with ground almonds, this non-dairy alternative is enjoying a real boost in popularity. Hailed for its health benefits, almond milk is low in calories, lactose-free and has no cholesterol or saturated fat.

Texture: Almond milk's very low protein content would suggest it doesn't stand up well to being heated. However, there are lots of almond milk alternatives being developed that are suitable for use in espresso and milk-based beverages. Some of these involve blending the almond milk with, for example, coconut milk or oil to produce a 'fattier', creamier, more protein-rich texture.

Taste: As you might expect, almond milk tastes...well...nutty. It's a sweet milk with a distinctive taste that's subtler than soy. With its inherent nuttiness, it can complement the flavour of some coffees. In fact, the 'almond milk latte' is becoming quite the speciality item on some coffee shop menus.

Home brewer's tip: Almond milk is dead easy to make at home. Soak whole raw almonds in water overnight with their skin on and a pinch of salt. Blitz in a blender with water and strain through muslin for a few hours.

Oat-based milk

A relative newcomer to the non-dairy scene, low fat, fibre rich oat milk is quickly rising in popularity to become the 'go to' cow's milk alternative. In fact, according to one producer, it's already the milk of choice for some Scandinavian baristas.

Texture: Oat milk has a high protein content, which makes it good for steaming. It produces good milk foam and splitting is less of an issue than with other non-dairy alternatives. It can have a bit of a powdery aftertaste, though...

Taste: As you might expect, oat milk has a subtle 'oaty' taste which makes it a good choice for people who want to taste their coffee rather than the milk surrounding it. It is sweet, but less so than soy and almond milks.

Home brewer's tip: Don't expect your coffee to dramatically change colour when you pour in oat milk!

So, what's the verdict?

Ultimately it comes down to personal preference. Having tried all three, I'd have to say my favourite is (mild, unsweetened) soy, simply because I enjoy the taste. However, it does overwhelm the flavour of the coffee and I don't enjoy all those clots!

Of course, purists will forever argue that adding anything to coffee ruins the experience (something that prompted Oliver Strand to write in *The New York Times*: "...In the world of high-end coffee, lattes are for amateurs and soy or nut milks are for chumps.")

Fortunately, for non-dairy coffee drinkers who want to indulge in their favourite cappuccino, latte or cortado, the days when the barista had to dig around in the back of the fridge to find the sad carton of sugary 'soy milk drink' are coming to an end.

Globally, the non-dairy market is expected to be worth \$19.5bn by 2020, with annual growth of 15%. This suggests that non-dairy options are only going to increase and improve as savvy consumers, baristas and coffee shop owners demand products that work with, not against, the bean.

Reducing sweetness, improving texture and minimising strong flavours will all make these nut and plant-based milks genuine contenders to become the preferred option for anyone who requires, or desires, a non-dairy coffee drinking experience. All of this means that ordering your perfect beverage at the coffee counter could become an even more complicated affair! Unless, like me, your 'usual' is a straight-up black Americano.

Links:

1. <http://www.businesswire.com/news/home/20151126005143/en/Research-Markets-Dairy-Alternatives-Soy-milk-Almond>
2. <https://scienceandfooducla.wordpress.com/2015/07/21/the-science-of-steamed-milk-understanding-your-latte-art/>
3. <http://www.smh.com.au/national/baristas-help-design-foolproof-nondairy-milk-coffees-20150918-gjps33.html>
4. <http://fortune.com/2015/05/27/almond-milk-sales-soaring-health/>
5. http://www.nytimes.com/2014/06/11/dining/the-best-iced-latte-in-america.html?_r=4
6. <http://www.businesswire.com/news/home/20151126005143/en/Research>

Other sources:

1. <http://thefuturescentre.org/articles/3774/europe-and-us-see-significant-rise-non-dairy-milk-substitutes>

2. <http://www.abouttimemagazine.co.uk/food/top-5-almond-milk-latte-london/>

3. <https://www.sbs.com.au/food/article/2016/03/18/rise-almond-milk-coffee-and-how-make-amazing-one-home>

Written for the (now defunct) Love Coffee Beans blog

