'Disruptive' Food Products Prove To Be More Hype Than Bite

Is the Age of Food Disruption Over?

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Summary

The consumer food industry has witnessed an explosion of disruptive innovation for food products over the past decade. These disruptions can be seen in food products such as plant-based meats, insect protein bars, synthetic fat replacers, precision fermented milk proteins (and sugars), and many more. All promising to revolutionize what we eat. However, there has been more hype than bite for many of these products. Plenty of these trends have failed to catch on with consumers, have seen limited revenue growth, and/or have not been profitable, as many investors have learned. One of the key lessons (particularly for investors from outside the food and agriculture industry) has been that it's more challenging to change what consumers eat than how they eat. Especially if there is a familiar, better-tasting alternative. Furthermore, the economic environment has also changed.

So, get ready for boredom, because the next few years will bring about far more incremental innovations and fewer disruptive innovations to consumer food products. Disruptive innovations will likely face more rigorous evaluation, resulting in fewer but potentially more successful disruptive products that have endured more intensive vetting. Meanwhile, we are already seeing an uptick in the number of incremental innovations on shelves and in restaurants.

Disruption Has Been a Buzzword for Years

Disruptive innovation is often conflated with any breakthrough in an industry. To put a clear definition to it, disruptive innovation is "the introduction of a product or service into an established industry that performs better and, generally, at a lower cost than existing offerings, thereby displacing the market leaders in that particular market space and transforming the industry."[1,2]

In this report, we focus specifically on disruptive innovations of consumer food products. Disruptive food products are many and varied. Examples include:

- Plant-based meat alternatives, such as plant-based burgers, chicken tenders, hotdogs, and meatballs.
- Precision fermented products, such as whey powders and sugars that have been launched as ingredients in ice creams and cream cheeses.
- Insect products, such as proteins used in snacking bars.

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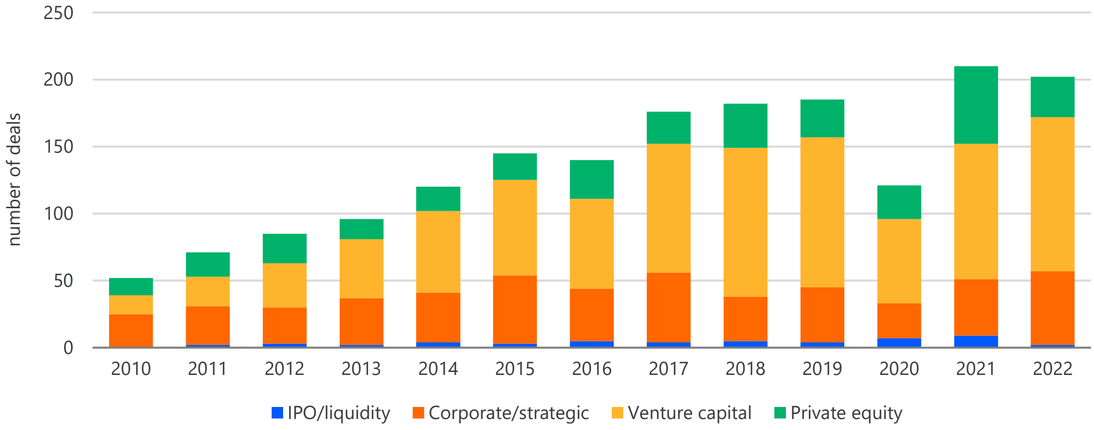
[1] TechTarget.com

[2] For more on the definition of disruptive innovation, read this Harvard Business Review article: "What Is Disruptive Innovation?"

- Fat replacers, primarily synthetic fat replacers used as a substitute ingredient for plant and animal fats.

Between 2010 and 2022, the global consumer food space saw a 288% increase in the number of deals in consumer food innovation (*see Figure 1*). Venture capital funds accounted for an average of around 50% of the deals over this period. Around 40% of these were in the earlier stages, such as seed funding through Series B funding. According to PitchBook and Rabobank's Foodbytes team, a relatively high share of the bigger deals also fall under the disruptive consumer food banner, accounting for 67% of deals in 2022.

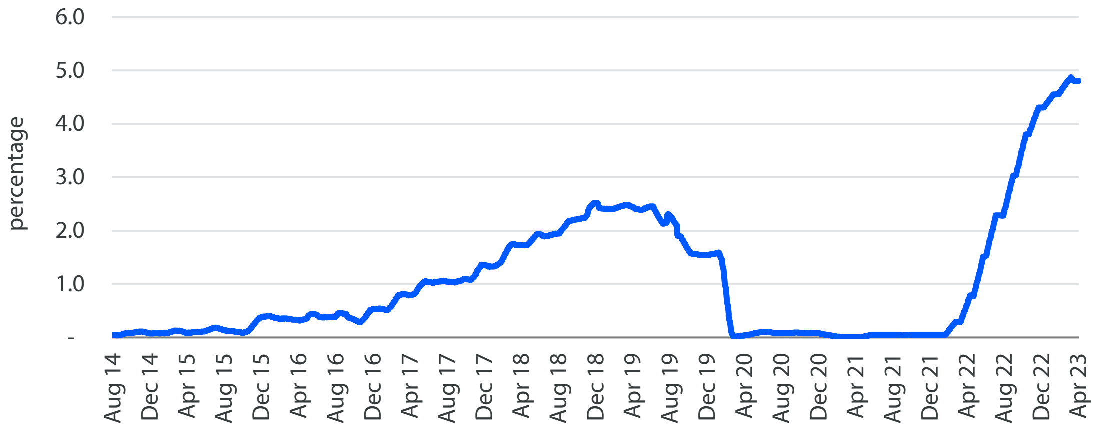
Figure 1: Global investments in consumer food innovations, 2010-2022



Source: PitchBook, Rabobank 2023

The drivers of this explosion of investments were many, but arguably the most significant was the lower interest rate environment, which at its lowest point drove the peak of deal activity in 2021 (*see Figure 2*).[3]

Figure 2: Secured Overnight Financing Rates (effective interest rate), Aug 2014-Apr 2023



Source: Federal Reserve Bank of New York, Rabobank 2023

Furthermore, the flurry of activity in 2021 was supported by an influx of bullish investors with cash reserves on hand after a very turbulent 2020. Strong consumer trends and demographics have also played a role in demand for disruptive innovations.

Millennials and Gen Z are both adventurous, conscientious 'foodies' who tend to seek more fun, exotic, novel, and sustainable foods. As a result, products have been launched with these trends in mind. Just wander through any food show and you will be amazed by the number of novel

[3] Lower interest rates mean a lower cost of capital. They can also help boost valuations as decreasing interest rates will be factored into discounted cash flow models.

products targeted at millennial and Gen Z consumers; think seaweed jerky, insect protein bars, and plant-based meat alternatives.

Investors have also played a major role on the supply side in bringing disruptive innovations to market. Private equity and venture capital funds caught on to the foodie trends and, as a result, started allocating more of their investments to food innovations. It's worth noting that there has been conflation of food and climate tech solutions. The rise of disruptive technologies in food – primarily plant-based solutions to reduce carbon emissions – has been a factor. As investment funds were drawn into food innovation, this also pulled existing food companies into the disruptive space so as not to miss out on opportunities. For example, food companies allocated more spending to internal R&D focused on disruptive technologies. They also built out their own innovation investment arms, for example Kellogg Company's corporate venture arm, Eighteen94 Capital, General Mills' 301 Inc, Hershey's C7 Ventures, and others.

These various factors have all come together over the last decade to create a hotbed for the rise in disruptive food products entering the consumer food space. Still, the world has changed since 2020, and many of these investments have not played out the way investors would have liked. Many products have delivered low revenue growth and profitability, and valuations are under pressure from rising interest rates and a number of other challenges.

Here Come the Headwinds

Companies and investors who poured into disruptive consumer food products found themselves struggling as myriad challenges shifted the consumer food industry as we knew it:

- **The interest rate environment** that helped to drive the influx of investments has inverted, and we are now in a much higher interest rate environment. This is having an impact on valuations of companies and the cost of investments around innovation. For example, lower interest rates in a discounted cash flow model will raise the valuation of a business, and the inverse occurs as interest rates rise because the cost of debt increases.
- **The geopolitical environment** is also facing challenges. Re-globalization[4] is reshaping global trade alliances, resulting in the need for companies to focus more time and capital on adapting to the changing landscape, such as through nearshoring.[5] Geopolitical issues have led to supply insecurity for some items, such as plastics in packaging, which were constrained due to plant closures in China during Covid-19. Ingredients like wheat have also been curtailed due to the Russian invasion of Ukraine, a large wheat exporter. As a result, company strategies are shifting to account for these types of risks. Companies are now working with more twin suppliers and, in some circumstances, relocating production facilities to increase supply security. Looking forward, a high level of uncertainty remains, which continues to drive elevated volatility.
- **The volatile commodity markets** have impacted everything from energy to food ingredients. This volatility required greater focus and investments in business practices such as price risk management strategies.
- **The labor market** has also been an ongoing challenge across the food supply chain, leading to higher costs and shortages. The labor shortages span the entire supply chain from farm to fork, resulting in impacts such as reduced restaurant operating hours and increased margin pressure. There is no clear end in sight for the challenges facing the labor market as inflation pressures remain, and even as inflation eases, wage levels do not.

As a result of the above challenges, food companies are focusing their vision of product innovation on innovations that prioritize commercial viability. In other words, those that are more

[4] Re-globalization is the process of countries establishing new economic cooperation, communications, and alliances in the changing geopolitical landscape.

[5] Nearshoring is the activity of bringing production and suppliers closer to home.

likely to be profitable and are easier to manage through market challenges such as volatile pricing of ingredients and supply insecurity due to geopolitical uncertainty.

Another critical issue to address has been consumers. Inflation is pushing consumers to value-based purchasing decisions rather than values-based – i.e. affordability over other added attributes. This shift is evident in the rising share of private label sales, as reported by Kroger in their Q4 2022 earnings and TreeHouse Foods in their Q1 2023 results, which demonstrated private label sales volumes outperforming those of brands.

Investors may have overestimated consumers' willingness to dramatically change their diets. The relationship people have with food is much more intimate and difficult to disrupt than their relationship with other sectors. Do not try to disrupt Italy's deep-rooted food culture, for example. The Italians are seeking regulations on plant-based nomenclature and a ban on lab-grown meats. While this is partly a political move, it is also a reflection of Italians' passion for food. There is also a growing and robust consumer trend of back-to-basics, minimalism, and less-processed products, as outlined in an article by Forbes on the top trends driving change in the food industry. To put it simply, when it comes to food, consumers do not necessarily want to consume products that need explaining.

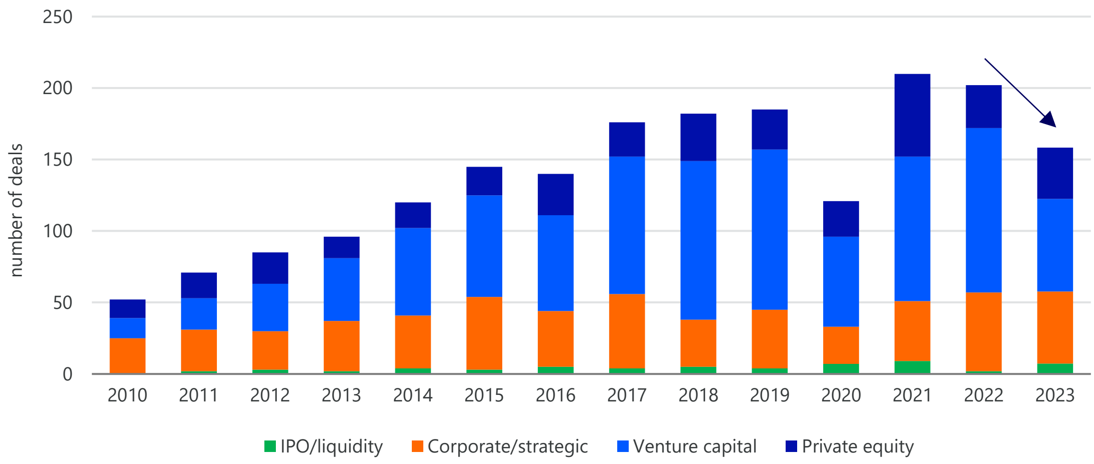
Last, but not least, many of the newly developed disruptive food products simply don't taste that great – as highlighted in Nick Fereday's recent Rabobank report *In Search of Real Food*. The taste issues are also seen in studies similar to the one Kerry undertook for plant-based meat alternatives. Beyond taste, it should also be noted that there are health benefits to some of these products. Many of the newer disruptive products are ultraprocessed, use an unfamiliar manufacturing process, or have ingredients that consumers are uncertain about – such as various chemical compounds (which are generally safe – otherwise they would not receive GRAS status[6]) that draw unwanted attention. New products that do not address these issues are likely to continue to face challenges gaining repeat purchases by consumers.

Hype Cycle Over

Disruption as the focus of innovation strategy has likely crescendoed in consumer foods – for now. Weaker demand for disruptive innovations, economic uncertainty, and the higher interest rate environment have exacted their toll on many disruptive products coming to market. The same group of investors that drove the 288% increase in deals from 2010 to 2022 appears to have put the brakes on deals so far in 2023. Annualized deal numbers through May 2023 are down 22% compared to 2022, but the share of disruptions in this segment has remained over 60%.

[6] GRAS is an acronym for the phrase "generally recognized as safe" used by the US Food and Drug Administration (FDA).

Figure 3: Global investments in consumer food innovations down 22% in May 2023

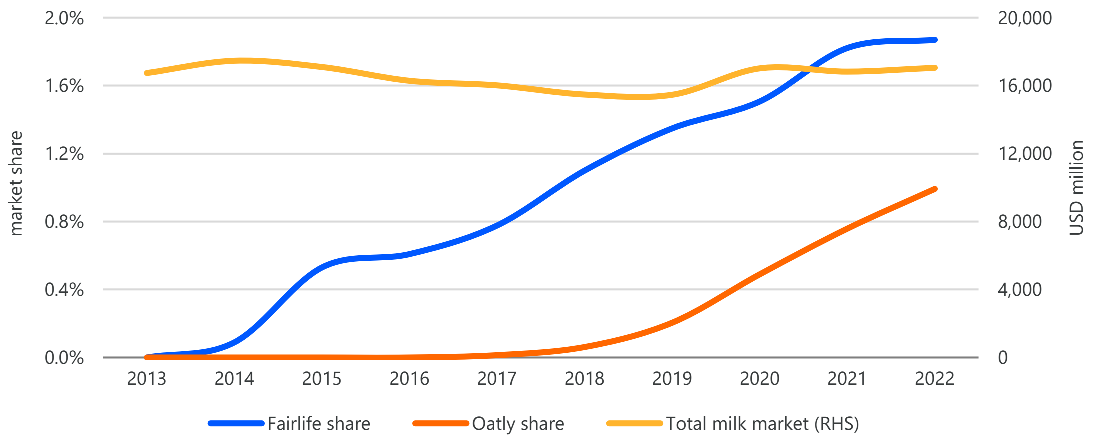


Source: PitchBook, Rabobank 2023

Looking at plant-based meat alternatives as a proxy for underperformance, some of the bigger names have struggled to catch on in both grocery and foodservice. After a 39% jump in retail sales volumes in 2020, plant-based meat alternatives saw a 3% drop in 2021, followed by a 6% drop in 2022, based on IRI data. Overall, plant-based meat products have yet to collectively make a dent in the market share of traditional meat products, accounting for less than 1% of the market.

It's not all bad for plant-based products. Plant-based milks have fared much better. Oatly has received great reviews and adoration from consumers, bolstered by very clever marketing, and they successfully raised USD 1.4bn when they became publicly listed in 2021. However, in terms of sales and penetration in the milk category, Oatly has at best performed on par when compared to a traditional (but innovative) milk product like those produced by Fairlife. Oatly has seen strong revenue growth, but they are still below 1% of the milk category, tracking slightly below Fairlife's first five years, demonstrating that incremental can be a winning strategy (*see Figure 4*).

Figure 3: Incremental innovation versus disruption in the 'milk' category, 2013-2022



Source: IRI, Euromonitor, Rabobank 2023

Numerous studies demonstrated that plant-based meats (and milks) are perceived as inferior in terms of taste, when compared to incumbent products. Also consumers viewed the highly processed nature of these plant-based alternatives as problematic and possibly unhealthy. Speaking of health, a head-to-head comparison of Fairlife with any plant-based milk will demonstrate that Fairlife almost always wins, in terms of containing a higher protein content and lower sugar per serving. However, it is far from over for plant-based meats and milks (and other disrupters). In the case of alternative milks, their share will continue to grow, albeit gradually. Meanwhile, plant-based meats will likely be looking at incremental product innovations (taste and texture enhancements) as part of their strategies in the future. For more thoughts on this topic, be on the lookout for a new report from my colleague JP Frossard: *Alternatives for Plant-Based Meat Alternatives*.

A Shift (Back) to Incremental

Incremental innovation "is a series of small improvements or upgrades made to a company's existing products, services, processes or methods," according to TechTarget. Incremental innovation is the long-standing approach to innovation in food, and has remained the core driver for innovation, even through the hype cycle of disruptive innovation. Incremental innovation is considered safer and does not have to be headline-grabbing. Instead, it creates new value through minor product or service adjustments. In food, incremental innovation looks like line extensions, packaging changes, new flavors, and functionality twists. Incremental tweaks are coming in thick and fast. An example of such an innovation trend is tiny versions of existing products, including mini Twinkies and Doritos. (Note: Controlling portion size is also a way of allowing consumers certain indulgences they may not go for in larger formats.)

Taste and format innovations are great, but the main benefit of incremental innovation is that it offers more immediate benefits: supply chain simplicity, sustainability, cost reduction, and generally keeping customers happy and interested. Furthermore, incremental innovation is better suited to keeping prices low for consumers in an inflationary environment like the one we have today. As new disruptions become less frequent, it is possible that we will see an increase in incremental products in grocery and foodservice to fill the gap. Based on discussions with industry professionals, we expect that retailers will be looking for innovations to keep their shelves interesting for consumers. And with more innovations coming forward, we could see faster range rotations and optimizing of shelf-space margins for retailers.

Recently, there have been some big names announcing moves to incremental innovation. Chobani has spent years expanding from Greek yogurt into coffee, dips, creamer, and oat milk. They have announced they will focus on innovating in their existing core, which means incremental innovations in flavors, packaging formats, and convenience. Roughly around the same time, McDonald's announced that it would shift its innovation strategy to one that is incremental. For example, McDonald's will be revamping older products with a twist, such as the limited-time-only Chicken Big Mac, and optimizing existing traditional products for taste.

Due to the many changes in the market, consumer trends, and financing, many other companies and R&D departments that have focused on disruptive innovation over the last decade will likely follow a similar path to that taken by Chobani and McDonald's and shift back to incremental innovation. These F&A companies will still need disruptive innovations. However, they are less likely to take on as much of the task of developing these innovations due to de-risking and cost-cutting measures.

Amara's Law

We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run."

It appears that many people overestimated the impact of disruptive innovation on the consumer's diet in the short run, judging by the precipitous decline in investments. The next few years will be challenging for many smaller startups and disruptive innovations, but it's not the end. Disruptive innovation will be needed; the number of disruptions, funds chasing disruption, and deal activity will be reduced; and the competitive landscape will change. Large consumer food companies will be the primary group shifting their innovation focus to incremental.

The last decade of disruptive innovations in food has changed the way consumers and the industry think about innovation. So while the consumer food industry reverts to an older form of innovation (perhaps akin to what we saw in 2015), there will likely be more modern and edgy incremental product innovations – a balance of the old and new. Consumer food companies will look for innovations to keep costs low and maintain top-line growth, profitability, and alignment with modern (more open) consumer tastes and preferences. The types of incremental innovations these companies will seek are: SKU rationalization,[7] packaging innovations, sustainability improvements, and intense new flavors. For example, we will likely be seeing a lot of new flavors, such as Mitsuba's award-winning Street Food Mix (which contains Indonesian Coconut Peanut Satay, Thai Green Curry, and Vietnamese Beef Noodle flavors) as outlined in Rabobank's recent report *Snacking Innovations Go Beyond the Sweet Surface at ISM 2023*.

Feedback from the industry indicated that companies will continue to look for disruptive technologies, both those that directly add to their core product portfolio and those that are peripheral, such as a new sustainable packaging format. However, according to discussions with industry experts, companies' strategies are likely to shift, in that they will no longer invest as much in R&D toward disruptive innovation. When they do seek disruption, they will look to external partners such as private equity and venture capital funds, or platforms like Foodbytes. This will help keep the disruptive innovation pipeline of consumer food companies alive while de-risking.

For the private investors, private equity and venture capital funds, there may be fewer high-risk, disruptive food products. The amount of funding has decreased, and the higher cost of capital will leave less room for failure. We expect funds to play a vital role in the lifecycle of innovation that many consumer food companies may come to rely on. After lessons learned over the last decade, the challenging financial environment and recent incremental focus may also drive funds to more heavily scrutinize disruptive innovations as part of their growth cycle to help ensure greater success. The combination of heavier vetting and a reduced number of disrupters should mean that the disruptive innovations that do come to market stand out more and could be more successful. According to Amara's Law, disruptive innovations may have underperformed against our expectations for now, but they are likely to come back with greater success at some point in the not-too-distant future and surprise us with their impact in consumer food products.

Conclusion

The consumer food industry has experienced an explosion of investments in disruptive innovations over the past decade, driven by a number of factors such as an increase in venture funds shifting into the food industry, companies seeking to disrupt categories, and the desire to stay relevant amid changing consumer demands. However, many of these investments have not seen growth or been as profitable as investors would have liked due to numerous challenges in the industry, including supply chain disruptions, changing consumer behavior, rising interest rates, and regulatory constraints. Moreover, the intimate relationship that consumers have with their food makes it difficult to disrupt deeply rooted personal preferences and even cultural practices. As a result, the hype cycle is over for disruptive food products. Incremental innovation will be a more effective strategy, particularly in the near term.

The implications of this report for consumer food companies is that they should focus more on commercially viable incremental innovation rather than on moon shot disruptive food products. Innovations should prioritize improving taste, convenience, and health rather than being caught up in the hype of disruption.

[7] SKU rationalization is the process of examining existing products and eliminating any SKUs that are underperforming or unneeded within the catalog.

It is safe to assume that those who continue to invest in disruptive innovations will need to exercise even more prudence when it comes to disruptive food products. Specifically, they will need to take more steps to ensure product alignment with consumers in terms of taste, health, and convenience. These investors who choose to continue to seek out disruptive innovations will be a good source of insight for large food companies that are currently shifting to incremental innovation but need to keep an eye on the longer-term horizon.

The next few years will see more incremental innovations and fewer total disruptive innovations. The increased due diligence and vetting of disruptive innovations for consumer food products will help to ensure even more success. Also, fewer disruptions overall in consumer foods will leave room for more incremental innovations on retail shelves and in restaurants. Retailers, restaurants, and their suppliers will need to align on their newly evolving innovation pipelines. While disruptive innovations underperformed against our expectations this time around, the quality of the disruptive food products will be higher in the future and may catch us off guard, based on Amara's Law. So, while you're enjoying your incremental innovation, keep an eye out for the next big thing coming down the pike, because you do not want the future of food to pass you by.

Imprint

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