

Design Thinking for Food: An Overview and Potential Application for Grains

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In the dynamic and changing world of food product development, design thinking is being used as an effective innovation tool kit to help researchers, product developers, and food designers create breakthrough solutions to complex challenges. The use of design thinking as a tool kit for innovation is not new; in fact, it has been utilized for more than 30 years and was first put into practice by companies and institutions such as IDEO and Stanford University. As described by Kolko (2), design thinking has been used in many different industries, including automotive design, health care, financial services, and consumer packaged goods.

What exactly is design thinking? Design thinking is a human-centered innovation process that uses three lenses to uncover what people need and design meaningful solutions: desirability (people), feasibility (technology), and viability (business) (Fig. 1). The design thinking process starts with understanding what people need and desire, whether they be consumers, internal stakeholders, or external customers. However, design thinking takes a more holistic approach by considering all three lenses throughout the process. The design thinking process traditionally has four phases: insight and inspiration, synthesis and strategy, design and iteration, and storytelling and communication (Fig. 2). Each phase has key activities and outcomes. It also uses convergent and divergent thinking in each stage to push the design team's thinking to the outermost areas in order to uncover breakthrough solutions, while mindfully applying constraints to make ideas actionable.

As much as design thinking is about the process, it is also very much about the people who use it. The design thinking process thrives in a multidisciplinary team environment, asking participants to be "T-shaped" (Fig. 3) and to use their depth of expertise at points of convergence and their adaptive qualities to be generative, collaborative, human-centered, and optimistic throughout the process. Although optimism often does not seem like a crucial team attribute, it is one of the most critical ingredients in a process that strives to deliver radical and relevant innovation.

Why is design thinking so important for food right now? Although the process has existed for many years, an increasing number of design thinking programs focused on food solutions are being established at universities such as the University of California, Davis; Stanford University; and the University of California, Berkeley. These programs apply design thinking to everything from new product development to food system challenges, such as reducing food waste. Consumer attitudes and

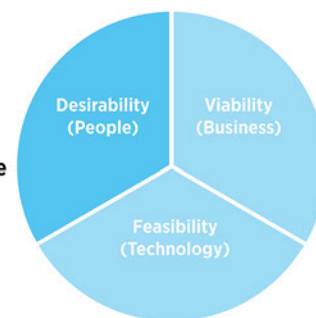
purchasing behaviors across many categories, including bread, baked goods, and breakfast cereals, have undergone significant changes in the last 5 to 10 years, as have consumer perceptions of larger food companies and the growing number of organic and natural food businesses. With such notable shifts in behavior and their effects on these categories and the respective business that serve them, the value of a human-centered innovation process has grown, driving a strong need to not only understand consumer behaviors and perceptions, but also to find and successfully execute the opportunities within them. Design thinking is a unique innovation process that bridges the gap between qualitative consumer learning and tangible product design—all through the efforts of a single project team.

The design thinking process is already changing the future of food production: whether through successful product launches or at a food systems level as we navigate the global challenges of sustainable food production. Five unique ways in which the design thinking process can help create this new future of food production are discussed.

Design Thinking Brings Everyone Together from the Start

Although it may sound simple, the design thinking process brings together team members from different disciplines within an organization at the start of the project and, as a result, creates a more collaborative and effective team. A multidisciplinary team inspires diverse perspectives, from the design research phase, through the synthesis phase, to the design and iteration phase. A typical project core team working on a product development challenge could include members from marketing, research and development, sales, packaging, and consumer insights.

Multidisciplinary teams help frame the problem in new, multifaceted ways. By looking at the design challenge from different perspectives, backgrounds, and, in some cases, even different vocabularies, highly creative solutions can be devised. This cross-disciplinary format also invites team members who might not traditionally be involved in a particular phase to be fully immersed throughout the project. For example, when food scientists and packaging engineers are included in consumer research,



Design Thinking starts with **people**

Fig. 1. The three lenses of design thinking.

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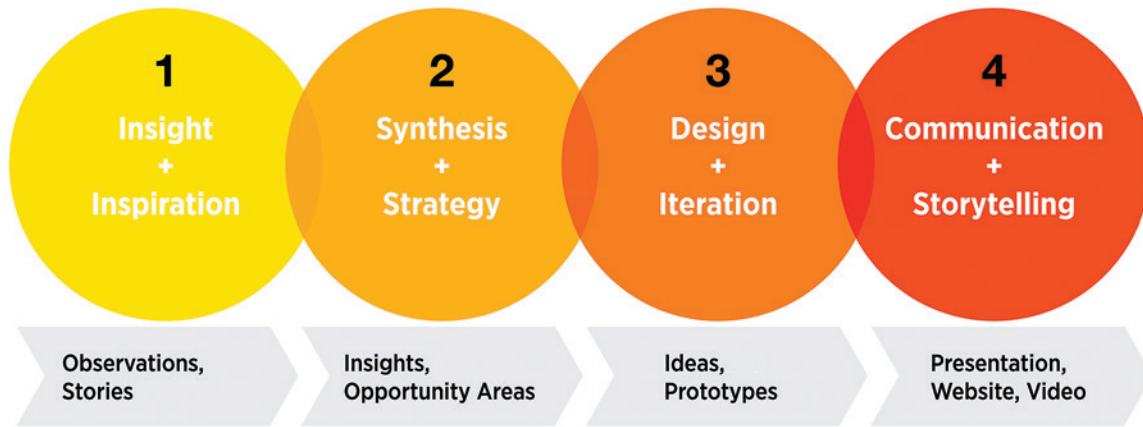


Fig. 2. The four phases of design thinking.

Team members are “T” shaped. Have a depth, or **expertise**, and a breadth, or **adaptability**.

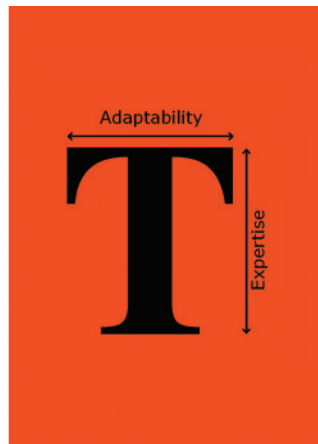


Fig. 3. A design thinking team.

they receive input directly from consumers and can more fully integrate those insights into the design phase. Working with team members from marketing and consumer insight disciplines during the design and iteration phase can help build empathy and understanding concerning technical constraints as the design is developed. Furthermore, involving team members from different parts of an organization at the start of a project creates ownership, resulting in a more closely aligned team.

Design Thinking Builds Empathy (Especially for Food Scientists)

Building empathy for the people involved (consumers, customers, and key stakeholders) is the heart of the design thinking process. Design thinkers strive not only to listen to what people say and watch what they do, but to also go a level deeper and seek to understand how people feel and what they think. This desire to empathize with consumers is particularly critical because consumer attitudes toward food are changing. In the grain category, there have been significant changes in the purchase and consumption of grains and, in general, carbohydrate-rich products such as breads, breakfast cereals, etc. With these changing attitudes and the emergence of new technologies, ingredients, and products, it is even more important to understand the attitudes and perceptions of consumers and to identify the opportunities that exist. For food scientists, engineers, and developers, it is often tempting to educate consumers about their misperceptions. With the recent waves of “low-carb, high protein” consumption that have followed trends such as the South Beach and Atkins diets and, more recently, the Whole30 diet, consumers

have a variety of opinions about carbohydrate-rich foods (e.g., breads, pastries, pasta, pizza, etc.). In these moments, however, the opportunity is not to correct consumers but to seek to understand why they believe what they believe, who or what is influencing them, and what new opportunities exist because of their beliefs. Today the marketplace is filled with a much wider variety of whole grain products, gluten-free alternatives, and ancient grain-based products, in addition to traditional products; clearly the food industry is leveraging new consumer behaviors and opinions.

Sometimes consumer behavior is more emotional than rational, especially as it pertains to food. As an example, research was conducted with consumers concerning breakfast. In the past, breakfast commonly consisted of ready-to-eat breakfast cereals and milk, toast, frozen waffles, and other prepared-at-home items. However, the frequency of consumption of these items for breakfast has been changing in recent years. When discussing breakfast, many consumers explained that they did not have time in the morning to prepare traditional foods. In some conversations, consumers said that they would leave the house and purchase their breakfast from a fast-food chain drive-thru or at a coffee shop.

It is clear that it takes less time to prepare ready-to-eat cereal or toast at home than to drive to a restaurant and purchase breakfast. The empathetic design thinker observed, however, that these consumers felt very differently about these two moments, and their perception of time spent was not solely quantified by actual time spent. Five minutes at home eating breakfast cereal or waiting for bread to toast was less desirable than ten minutes spent driving and waiting in a drive-thru line for a warm breakfast sandwich and a coffee. The design thinker saw these tensions and perceptions as opportunities to design differently. For example, what advantages of the drive-thru experience could be created in the home? How could the current stress points of preparing breakfast at home be addressed? How might food preparation time in the morning be rethought?

Consumers are more engaged than ever in their food choices, and developers, manufacturers, and researchers must understand the “why” behind their choices in order to create new and meaningful products. By spending time with consumers in their homes, workplaces, and grocery stores, the design thinking team can build empathy for consumer choices and integrate this understanding into the design, formulation, and commercialization of new products.

In addition to empathizing with consumers, understanding the needs of customers such as retailers and key stakeholders is

critical to the success of any new initiative. The design thinking process includes “looking in” interviews and observations that look into an organization and understand the desires of key decision makers, as well as looking into the needs of purchasing and retail customers. By taking this additional step early in the innovation process, these viewpoints can be addressed when creating the strategy, designing the product, and telling the story of the process.

Design Thinking Evolves Ideas from Good to Great

Although speed to market is often one of the biggest challenges of product innovation, the design thinking process allows time for ideas to incubate and grow during its design and iteration phase. By creating space in the innovation timeline, teams are given the time to evolve their ideas based on qualitative, iterative feedback from internal team members or external consumers and through building-to-think experiments, using rough and rapid prototyping.

Qualitative, iterative feedback can be obtained by showing consumers rough sketches or early, low-fidelity prototypes. When the resolution of ideas is kept low, consumers recognize that an idea is in development and often feel more comfortable suggesting changes rather than giving validation-type feedback. In an ideal feedback scenario, ideas are shown to consumers in their homes to elicit contextual feedback, with the option to pantomime or role play with the rough prototype. Such in-context sessions identify realistic constraints and scenarios that might not otherwise be considered during the development process. This feedback can be used to conduct additional brainstorming on ideas with both constraints and consumer needs in mind.

By spending time evolving and optimizing ideas, the team can better design products for success in the market, as well as for success in quantitative testing, which is often a key hurdle prior to product launch. This iterative step may be skipped by teams who are pressed for time or whose excitement and momentum move the process forward quickly. In skipping this step, however, teams run the risk of taking an idea forward before it is ready, which often results in the need to take additional time to redesign or react to less than desired quantitative outcomes. In a worst-case scenario, good ideas fail to make it to market entirely or launch with poor results because they were not given enough time to evolve and become market ready, wasting the efforts of the team and missing internal goals. Design thinking intentionally creates incubation time to give ideas the best chance for success.

Design Thinking Redefines Food Prototyping to Move Smarter, Faster

Food prototyping typically includes formulation in a test kitchen, lab, or pilot plant and often also includes sensory evaluation. Design thinking introduces the concept of rough and rapid prototyping as a way to build to think and improve ideas quickly without creating formulations or making edible prototypes. Rough and rapid prototyping uses simple materials to make a low-fidelity prototype that approximates the look, feel, size, shape, and packaging for a product in order to help teams think through ideas and improve them quickly without a large investment in time or money. This type of prototyping is especially useful early in the innovation process because it helps uncover important questions that need to be addressed.

As an example, imagine the design challenge of creating a new lunch-box bread product for school-age children. A typical pro-

totyping approach might entail going to the kitchen, choosing or creating a formula, and baking several variations of the items. Questions might ensue concerning the size and shape, taste, texture, ingredients, and nutritional profile of the product. After several hours, you might have several different prototypes of various formulas but likely will not have optimized the sensory attributes of the product. A rough and rapid prototyping approach might utilize something as basic as a modeling compound to create different shapes and sizes. Ingredients like sunflower seeds, poppy seeds, or oats might be pressed on top to approximate a seeded roll, sliced bread, or breadstick. New shapes, sizes, and forms can be quickly made, and questions can be explored concerning size, shape, appearance, ingredients, etc. Mocked-up primary packaging created using sandwich bags might be cut and heat-sealed over the prototype. Secondary packaging might be created using paperboard. The packaging could prompt questions about servings per package, fitting for store shelves, fitting in home cupboards or pantries, sustainability of materials, etc. These rough prototypes could also be placed in several types of lunch bags or boxes to determine which size and shape might fit best; what portion seems most appropriate; children's and parents' expectations for taste, texture, and nutrition; how it might pair with other lunch-box items, etc. In as little as an hour, several prototypes with packaging could be created, enabling the team to raise questions about the idea and more easily make potentially big changes to the idea.

The rationale behind building to think is to model ideas quickly so the end product can be understood more deeply. Rather than positioning prototyping as the high-fidelity production of an idea to its best formulation, it reframes prototyping to be a “designer’s playground,” where ideas can come to life, be questioned, safely fail, and evolve to be great. Rough and rapid prototyping gives teams permission to diverge from the plan and explore while asking tough questions and challenging themselves to create new solutions in a rapid timeframe.

Rough and rapid prototyping also plays an important role in the innovation process for key stakeholders and teams. For key stakeholders, prototyping can introduce an idea at an early stage and generate significant feedback without an overinvestment in time and money. It also helps the development team maintain a nimble and adaptive mindset. As the idea is iterated and refined, prototypes should be made with higher fidelity, including edible formulations. Design thinking introduces prototyping early in the innovation process as a tool to understand and better develop ideas from their infancy.

Design Thinking Uses Human-Centered Storytelling to Help People Connect with and Support New Ideas

Great ideas are key to innovation, but storytelling and communication are equally important steps in creating successful ideas. The fourth phase in the design thinking process focuses on human-centered storytelling, providing the time needed to help both key stakeholders and consumers understand and support new ideas. In this case, storytelling is not just another word for PR or marketing. In fact, it is quite different. Storytelling has three important parts: audience, content, and format.

Human-centered storytelling starts with the storyteller not only considering what should be communicated about a new idea, but critically asking, “Who is the audience and what are they thinking and feeling?” Taking a moment to consider who the audience is, whether it is a consumer, senior leadership team, or university department chair, gives the design team the oppor-

tunity to tailor their communication so they truly connect with their audience. Human-centered storytelling takes people's perceptions, misperceptions, priorities, and values into account when preparing to communicate a new idea. This strategy includes asking questions. Who is this for? What do they care about? What will they think about this idea? What burning questions might they have that must be answered immediately? Taking the time to frame the story for a specific audience and their needs and desires is essential in order for them to hear the story, connect with it, and ultimately support it.

Storytelling is not storytelling without great content to share, but how can content be shared in an engaging way that enables the audience to understand and receive the message? In his interview about storytelling, Ira Glass, executive producer of *This American Life* and master storyteller (1), discourages storytellers from writing in the style people were taught in high school, using a topic sentence and supporting points or facts, but instead to be constantly raising questions and answering them with your story. It is easy to become a "PowerPoint robot," using a template and falling into a pattern of presenting that may not communicate your ideas effectively and connect with the audience. Asking key questions can help focus the story. What is the big idea? What is the problem the idea is solving? What is the one thing the audience should remember? Asking how the audience should feel throughout can help provide structure for the story. Human-centered storytelling encourages the storyteller to think about communication and create a story arc. Stories from literature, such as Shakespearean tragedies or classic fairy tales, often use story arcs to engage the audience's emotions. Should the audience feel concerned, impassioned, or anxious? Should the big idea help them feel relieved, excited, or empowered? What questions should the story raise, and how can it answer them? Taking a question-based approach, you can create a focused and compelling story.

The third element of human-centered storytelling is the format—whether the story should be shared as a digital presentation, video, website, hands-on demonstration, etc. Once the audience and the content are identified, a format can be chosen to deliver the story most effectively. Several questions can be asked to aid in choosing the best format. What format would be most effective for the type of content? How does the audience prefer to receive information? Will the story be retold to others? The typical default format is a digital presentation, but in some cases the audience may be more receptive to a hands-on demonstration or to a more informal conversation. In one such example, a key stakeholder at a company was known for disliking long sets of digital slides and wanting to know the outcome as quickly as possible. The team recognized this and reframed their presentations to put the outcome in the first few slides, minimizing the total number of slides and creating a hands-on demonstration

when possible. In another scenario, a team successfully presented content in person to key stakeholders who wanted in-depth detail but found that when others shared the slide presentation, extended team members did not always take the time to read the entire presentation. In this situation, the team began to make 1–2 minute videos to accompany the slide presentation. These videos shared important highlights and could be easily shared throughout the organization. Those seeking more detail could read through the digital presentation. In both cases, the presentation format and preferences of the audience affected the way the content was received. Taking a human-centered approach to crafting your story can positively impact the support and adoption of new ideas.

Conclusions

The design thinking innovation process is well suited for food and beverage development, including grains, because of its focus on understanding the changing needs and desires of consumers, as well as key stakeholders and customers, and its primary objective—designing solutions to meet those needs. Design thinking challenges traditional food innovation practices with its human-centered approach and a building-to-think mindset, which is all in the service of creating meaningful and relevant breakthrough innovations.

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