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Integrating Health Leadership and Management Perspectives: The M.E.S.H. Framework for Culturally-Informed Food Design Thinking and Wellbeing Promotion

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Contributorship statement

This research work was a collaborative effort in which all authors contributed to its completion. Each author had an essential role in all the phases of the study, including concept formulation, data collection, analysis, interpretation, manuscript preparation, and critical revision of the final document. The authors worked together to make crucial decisions about the study design, apply methodologies, and identify suitable data analysis approaches. The manuscript drafting process was also a shared responsibility, where each author contributed equally to the writing and revising of the content, ensuring it meets the highest academic and ethical standards.

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Abstract

Purpose: This study examines the social and cultural life of food innovations to inform food design thinking. The authors explore this through wellness regulating functional foods, foods scientifically modified for health benefits based on medical and nutritional claims, as a materialization of food innovation in the marketplace.

Design/methodology/approach: Drawing on affordance theory, where affordance relations enable potential for consumer food wellbeing regulation, the authors gathered in-depth interview data from diverse consumer groups across three illustrative exemplar functional foods.

Findings: The research reveals how consumers engage in meaningful actions with functional foods in the experiences of their everyday lives. Four analytic themes emerge for consumer wellness regulation through functional foods: Morality judgements, Emotional consequences, Social embedding, and Historicity.

Originality: Analytic themes emerging from the findings are conceptualized as M.E.S.H., a useful acronym for the social and cultural life of food innovations within the design thinking arena. The M.E.S.H. framework includes dichotomous cultural affordances that overlap and entangle different cultural themes weaving together consumers' perceived possibilities for food wellbeing regulation. These cultural affordances reveal distinct paths that link consumer experiences and food design thinking.

Key Messages

What is already known on this topic: Prior to this study, food design thinking has been primarily focused on product-centered approaches and has often overlooked the importance of social and cultural factors in food innovation. The role of health leadership and management in shaping food wellbeing and the complex relationships between consumers and functional foods have not been extensively explored.

What this study adds: This research introduces the M.E.S.H. framework, which highlights the significance of Morality judgements, Emotional consequences, Social embedding, and Historicity in consumer wellness regulation through functional foods. This framework integrates cultural affordances and consumer experiences into health leadership and management-focused food design thinking, providing new insights into the social and cultural dimensions of food innovations.

How this study might affect research, practice or policy: The findings of this study have implications for researchers, policymakers, and marketers in the food industry, encouraging them to incorporate the M.E.S.H. framework into their food design thinking and innovation processes. This approach prioritizes consumer experiences and wellbeing, ultimately leading to more culturally sensitive and effective health leadership and management strategies in the food sector.

Keywords: Food innovations, food wellbeing, affordance, consumer experience, food design thinking

1. Introduction

This paper explores the significance of acknowledging the social and cultural aspects of food-product innovations in the context of leadership and management, with a focus on food design thinking (FDT). Food design is often viewed as a linear process aiming to create innovative food products, originating from food science or psychology, that resonate with consumers and generate profit [1].

Food design thinking, in particular, is an adaptation of general design thinking, where product innovators follow a step-by-step process, such as need finding, ideation, prototyping, and product launch [2] or consumer empathy, visualization, rapid prototyping, and collaboration [3]. Nevertheless, these models may overemphasize product-centered approaches and underestimate the role of culture in food consumption innovation [4].

Using the growing category of functional foods as a basis [5], we propose a theoretical model that incorporates the agency of functional food products within the social and cultural context beyond the food design environment. Our analysis considers the increasing concern for mindful consumption and wellbeing [6], as well as the shift in how eating is framed in society, focusing more on medicalized terminology [7]. The primary research question is: How can the socio-material agency of food innovations inform leadership and management strategies for creating healthy food experiences and enhancing wellbeing? We examine consumers' experiences of regulating food wellbeing through functional food consumption via in-depth interviews with three distinct functional food consumption groups: vitamin-infused water, plant-sterol/stanol-infused food products, and probiotic-infused foods. These products represent a diverse range of functional foods and their consumers. Utilizing the socio-material theory of affordances [8], we integrate the material agency of functional food products with cultural life to develop the M.E.S.H. framework for food design and innovation. The M.E.S.H. framework encompasses four

interrelated themes—Morality judgements, Emotional consequences, Social embedding, and Historicity—that offer insights on how to intertwine material and practical aspects of cultural life with innovation models such as food design thinking. Our findings contribute to refining food design thinking practices and addressing the complexities of food culture through the M.E.S.H. framework. Moreover, the M.E.S.H. framework can be used to support collaboration between food experts and cultural consumer insight specialists, working together to enhance food design thinking and integrate ongoing food design processes post-product launch. This study suggests that the intricate and multi-dimensional cultural experiences of food innovations, such as functional foods, can be understood through consumer food wellbeing regulation actions, where affordance relations raise awareness of food wellbeing opportunities.

2. Methods

This interpretive study produces a rich account of consumer and functional food interactions sculpted by ideas around health and food wellbeing regulation. The data collection was organized via three illustrative exemplar functional foods: vitamin-infused water to boost vitamin intake (i.e., bottled spring water infused with various combinations of vitamins); plant-sterol/stanol-infused products to reduce cholesterol, (e.g., infused drinks, spreads, and yogurts) and probiotic-infused products to stabilize gut bacteria (e.g., probiotic-infused drinks and yogurt and fermented products such as Kombucha tea). Consumers emerging around each product provide a diverse sample of consumers who are: younger and apparently healthy (vitamin water); older, with various chronic health conditions (plant sterol/stanol products); and an age- and health-status-diverse sample (probiotic products). The primary source of data for this study was 30 semi-structured interviews (Table 1), conducted on- and offline, based around stimulating examples of how the products are

consumed in daily life, and how they fit into experiences of lifestyle. Semi-structured interviews are consistent with an interpretive approach seeking to analyze individual perceptions of health and experiences of wellbeing. Study participants who regularly consumed functional foods were recruited through snowball sampling via incentive entree through personal networks. Our sampling strategy was structured by the premise of adding informants until no incremental insights are generated with each new interview.

Table 1. Participant Information

Pseudonym	Gender	Age	Health Status	Functional Food Consumption
Jaana	F	Young Adult	No reported health issues	Vitamin infused waters
Otso	M	Young Adult	No reported health issues	Vitamin infused waters
Linnea	F	Young Adult	No reported health issues	Vitamin infused waters
Mira	F	Young Adult	Weight problems	Vitamin infused waters
Antii	M	Young Adult	No reported health issues	Vitamin infused waters
Sanna	F	Young Adult	No reported health issues	Vitamin infused waters
Liisa	F	Young Adult	No reported health issues	Vitamin infused waters
Joona	M	Young Adult	No reported health issues	Vitamin infused waters
Markus	M	Young Adult	No reported health issues	Vitamin infused waters
Hanna	F	Young Adult	No reported health issues	Vitamin infused waters
Heini	F	Young Adult	No reported health issues	Vitamin infused waters
Mary	F	Middle Age	Diabetes	Plant-sterol/stanol-based products
George	M	Older Adult	Heart disease and diabetes	Plant-sterol/stanol-based products
June	F	Older Adult	No reported health issues	Plant-sterol/stanol-based products
Marjorie	F	Older Adult	Heart disease and diabetes	Plant-sterol/stanol-based products
John	M	Middle Age	Moderately high cholesterol	Plant-sterol/stanol-based products
Donald	M	Middle Age	High cholesterol and weight problems	Plant-sterol/stanol-based products
Pete	M	Middle Age	No reported health issues	Plant-sterol/stanol-based products
Heikki	M	Middle Age	No reported health issues	Probiotic products
Taru	F	Middle Age	Gastrointestinal problems	Probiotic products
Tedi	M	Middle Age	Food related illness	Probiotic products
Maari	F	Young Adult	Gastrointestinal problems	Probiotic products
Kaisa	F	Young Adult	No reported health issues	Probiotic products
Henna	F	Middle Age	Gastrointestinal problems	Probiotic products
Irma	F	Middle Age	Hyperthyroidism	Probiotic products
Juha	M	Young Adult	Weight problems/ food related illness	Probiotic products
Harri	M	Middle Age	No reported health issues	Probiotic products
Leon	M	Young Adult	No reported health issues	Probiotic products
Anninna	F	Middle Age	No reported health issues	Probiotic products
Simo	M	Middle Age	No reported health issues	Probiotic products

Each interview was transcribed in full. Transcriptions of these interviews contain only anonymized information. We refer to individual excerpts using pseudonyms to protect the anonymity of participants. To further anonymize participant data rather than refer to specific ages we break participants into age ranges that include young adults (22-34), middle age (35-64), and older adults (65 and older) (Table 1). Each participant verbally provided their informed consent, a recommendation laid out by the ethics review board at the time of data collection and which we followed.

Interviews with respondents began with “grand-tour” questions, focusing on participants’ biographies and their views on health and wellness as well as their perceptions of their exemplar functional food. Interviews followed an interview guide but allowed respondents the freedom to broach topics in their own way and to bring up relevant topics of their own. The interviewers asked follow-up questions and probed for further elaboration on emergent themes in the discussion. Probing questions led to a dialogue on a range of relevant topics, including wellbeing, health, nutrition and related activities like physical fitness. Data analysis occurred throughout the life of the research project and was a multi-stage process. Early phases engaged with the empirical material through a form of grounded theory analysis. Each author read the empirical material independently and derived analytic codes that captured and organized participants’ salient experiences and meanings. Through on-going discussions among researchers and colleagues, codes were continuously refined and collapsed into broader themes. Empirical data exemplars are presented deliberately in table (rather than prose form) to render the findings more accessible to a non-academic reader.

3. Findings: The MESH Framework

Emergent empirical themes (Table 2) construct the M.E.S.H. framework for food innovation. The connection between the cultural life of innovations and FDT can be thought

of as a fishing-net, borrowing a popular metaphor [9], where each element of the M.E.S.H. framework has its place as one of the knots in the net. When the net is stretched out between sociocultural understandings that shape consumer food wellbeing and FDT processes, each knot in the net becomes stabilized into a relationship with other knots in the net.

The first, “moral judgements,” explores axioms that participants use to evaluate functional foods, courses of action, or particular behaviors in terms of their moral implications. The second, “emotional consequences,” identifies emotional ramifications on participants’ lives connected to moral judgments. Third, “social embedding,” explores the structure of social environments in which our participants are embedded and their production of various social roles and norms that govern one’s goal orientation. Lastly, “historicality” illustrates how functional foods afford consumers food wellbeing regulation biographies over time.

Table 2. Coding for Socio-Material Affordances of Functional Food Consumption

Dimension of Framework	Description at the level of food well-being	Outcomes
Moral Judgements	Participants recount how particular sets of normative rules establish guidelines for eating functional foods	Emotional involvement
Emotional consequences	Participants consuming functional foods afford heightened emotional significance to food wellbeing regulation	Magnification of social structures
Social embedding	Participants develop their social context alongsid their consumption of functional foods	Reflection on self and society
Historicality	Participants food wellbeing regulation biographies are envolved into their consumption of functional foods over time	Enactment of behavioral scripts

For each dimension or knot of the framework, Table 2 gives a brief description and provides the associated outcomes that emerge from the cultural life that functional foods take on as consumers engage with them. To be clear, we make the methodological choice as researchers to treat each of these dimensions as conceptually distinct. For the experiencing individual, these are happening simultaneously. Due to our objective to show how to improve food design thinking, we showcase our most illustrative data excerpts pertaining to each element of the M.E.S.H. framework within tables that fall in their respective analysis section.

3.1 M for Morality

Table 3. Morality in Functional Food Consumption

Functional food affordances	Data Excerpts
Responsible citizenship through functional food choices	<p>Marj showed me the huge number of pills she is prescribed, and takes daily, carefully counted out into a large plastic week/day pill receptacle. She uses Benecol products and “trusts” them (the brand) to deliver health benefits (over the cheaper non-branded, supermarket own brands she tells me her daughter prefers to buy for her). <i>“It’s amazing what is available to buy these days, when I was young you had to get any medicine on prescription from the doctors”</i>. She said that her GP had advised her to start using it, but she felt <i>“it saves them (GP/NHS) time, people are always ill these days”</i>. Marj thinks she is being a comparatively responsible citizen by buying and using Benecol as a ‘medical product’ (Marjorie, F, Older Adult; heart disease and diabetes; plant-sterol/stanol-based products)</p> <p>Heini articulates a clear link between the consumption of functional foods (in this case vitamin water) and signaling responsible citizenship: <i>“If you think about showing values...social benefit, of course you signal with the product choice to others that I make these good choices, that I don’t walk around with a soft drink bottle in my hand.”</i> (Heini, F, Young Adult; no apparent health issues; vitamin water)</p>
Disciplining and/or enhancing the body through functional food choices	<p>Donald presented plant sterol/stanol products as if they were a weight-loss product – he made a direct link between high cholesterol and being fat. However, he said <i>“I know it’s not really that good for you, healthy eating is the best medicine”</i>. His partner Pete chimed in here and noted the expense of Benecol. This was framed as a point of contention in this couple, but Donald argued that <i>“if you are going to use margarine you might as well pick one with extra goodies in it.”</i> Donald described how he was taking some responsibility for his own health, via plant sterol/stanol products, at expense, even with doubts over the ultimate payoff. (Donald, M, 60 years old; high cholesterol and weight problems & Pete, M, Middle Age; no apparent health issues; plant-sterol-based products)</p> <p>Markus felt vitamin water, although it might only have a placebo effect, was a mood-enhancing product. <i>“I agree that what is sold to people, in the end, if you believe it works, it works. So at least I choose vitamin water over soda always. Soda makes you feel heavy and it is too acidic, and, maybe it gives me heartburn and stuff like that. However, vitamin waters are usually easy, and they really perk you up, you get a good feeling, and it is really</i></p>

better than just water, just because of the bubbling and the taste. And yeah, they neutralize the day.” (Markus, M, Young Adult; no apparent health issues; vitamin water)

Mira presented with concerns about obesity, she consumed vitamin water to help with her weight, but also to support her struggles with a range of other health concerns *“When I was younger, I was overweight. I struggled with it, or it shadowed me a lot when I was young. At that time, I controlled my weight a lot with my diet rather than by exercising. On the physical side, well generally as probably with many others, the goal of exercise for me is appearance-centric. That was maybe the starting point, of course if you are not happy with how you look, you do not feel good either. I actually have this thing that I try not to drink soda on weekdays. But at the end of the day, it doesn’t work that well for me. Or, I always drink vitamin water so as not to drink all those additives, and so that my teeth would not suffer when I drink.” (Mira, F, Young Adult; no apparent health issues; vitamin water)*

Mitigating or atoning for ‘bad’ food consumption via functional food

Joona used vitamin water to mitigate unhealthy consumption *“I do believe in vitamin water being good for me on such a level that I keep repeating it every time I’m hangover. It feels healthy and maybe feels like it purifies my body more than if I drank a soda or ate something greasy.” (Joona, M, Young Adult; no apparent health issues; vitamin water)*

“I would say vitamin water makes me feel better when I am hungover, or then it’s a sort of placebo, whichever works.” (Mira, F, Young Adult; no apparent health issues; vitamin water)

Janna reported using functional foods to mitigate unhealthy (bad) food wellbeing choices, *“Now for three days I ate about according to the plan or you know, I ate well, but then yesterday I took a hundred grams of chocolate and didn’t feel a thing. But then if I keep doing it, then I somehow feel bloated or slight self-loathing, like now my stomach feels looser or something, or somehow I might feel lazier and more tired.”* Janna consumes probiotic drinks as a way to manage her stomach condition, but reported that this was a balancing act between healthy and unhealthy choices that the functional foods supported. (Janna, F, Young Adult; no apparent health issues; vitamin water)

Sanna reported the use of functional foods as a balancing force in food wellbeing struggles. *“Maybe it is the balance; it is easy to start doing something over the top. So then I think for example eating is a bit difficult, it feels that if I do not eat treats, it is too strict, and if I do, then I feel bad and have a bad conscience and so on. It depends, usually it is ok for me to eat something a little unhealthy, or now it is a bit like if I eat, then I have thought it so that it is a sort of prize for something. Then sometimes I get these unhealthiness overloads, and they make me feel physically and mentally bad.” (Sanna, F, 24 Young Adult; no apparent health issues; vitamin water)*

In detailing participants’ functional food consumption, consumers expose that their actions are often structured around morality tied to the material objects of functional foods. That is, particular food items afford moral judgments and action possibilities through person-object relations, such as: consuming to be a better citizen through self-medicalization or display of healthful choices; disciplining or enhancing the unruly, demanding body through functional food consumption; and mitigating or atoning for “bad food choices” via functional foods (Table 3).

Consumers described functional foods as being better for food wellbeing regulation than something else they could consume, such as energy drinks, butter, pizza, beer, soda, or even medication. In terms of how this relates to medication, many aspects of contemporary life, including normal processes of aging, have become medicalized.

3.2 E for Emotional Consequences

Table 4. Emotion Consequences in Functional Food Consumption

Functional Food Affordances	Data Excerpts
Emotional stress regulator (personal)	<p>Maari recounts how her inability to adhere to a healthy regime becomes a site of negative emotions,” <i>It is not so much feeling sad about who I am but more about my lack of self-control. I feel like a weak person. I feel that it is not fair because why do I have to worry about what I eat all the time when others can eat whatever and not feel like crap.</i>” She reports that she consumes probiotic products to mitigate this negative emotional response. (Maari, F, Young Adult; gastrointestinal problems; probiotic products)</p> <p>George has a very good diet, and uses Benecol as part of his cholesterol regulating regime. However, he has a food wellbeing regulation weakness. He recounts how chocolate acts as an anxiety regulator for him, and how in the face of being unable to consume chocolate, uses functional foods to regulate the anxiety that ensues “<i>I eat a lot of diabetic chocolate, which is a lot better for me than regular chocolate. I have a terrible sweet tooth, and I tend to eat sweets and chocolate for anxiety really. Nowadays, I eat a lot of diabetic chocolate, which is a lot better for me than regular chocolate since I have diabetes. Having some sort of chocolate is non-negotiable, I have to have it.</i>” (George, M, Older Adult; heart disease and diabetes plant sterol/stanol products and diabetic chocolate)</p> <p>Kaisa recounts how she uses functional foods as an emotional wellbeing regulator, but alongside other emotional wellbeing regulators unconnected to food consumption. “<i>Probiotics make your intestines work better and your stomach feel better. I take it to help me with my stomach problems related to stress. I stress with my stomach. It’s the first thing that, I can think that I am okay and not stressing about things, but then my stomach is really weak so there are some foods that I do not eat as well. But, yeah, I also try to handle the stress though getting enough sleep, exercise as well as relaxation.</i>” (Kaisa, F, Young Adult; no apparent health issues; probiotic products)</p>
Emotional stress regulator (interpersonal)	<p>Henna relates her consumption of functional foods to her ability to emotionally regulate interpersonal stressors, seemingly unconnected with food, “<i>my stomach reacts when I stress. I once went to the doctor and they didn’t find anything...I make small things bigger than they are like friendship issues, school, the amount of stuff I need to do, and then I just get stressed how much there is stuff to do and how little time there is. And, money of course because I do not earn much money and everything is so expensive...I think that probiotics yogurts help. I don’t know if it helps or not, I just think that it helps or is my stomachache something that simply comes and goes, I don’t know, but I sometimes have it.</i>” She recounts that even though she is not convinced they help, they do support her emotionally in stressful interpersonal contexts. (Henna, F, 42 Middle Age; gastrointestinal problems; probiotic products)</p> <p>Annina’s narrative highlights the importance of other elements in the consumption ecosystem beyond functional foods: “<i>If I were to describe the perfect human, they would be athletic, not some sort of body builder but more like someone can run fast but has also muscles. But, otherwise the person is somebody who can combine</i></p>

successful career and also the family life. So it's not only about the looks. To have well-being means feeling good physically and mentally, so you also need to behave well at home and able to fulfil your tasks at work. I think well-being related to every aspect of your life. I have constant threats to attaining this and I struggle to combine these in life. For example, I think that my work is threatening my well-being at home because I don't have enough time to be with my family, especially my daughter. That effects constantly to my well-being because it's in the background and I have to think that ok, I don't spend enough time with her and how does she feel.” Annina foregrounds anxieties produced through the conflicts between interpersonal commitments (work and homelife) and the balance of well-being. (Annina, F, Middle Age; no apparent health issues; probiotic products).

While there are close links between issues of morality and concomitant emotional consequences, this section foregrounds a range of activities that stem from emotional stress linked to perceived functional foods affordances. The range of emotionality related to functional food affordances expands to include a range of activities within the consumption ecosystem related to health like getting enough sleep, exercising, relaxation, or other hobbies (see Table 4). The result is a feeling of agency as consumers are able to solve emotional challenges related to their health and wellbeing. Most of the participants seem to be emotionally driven to strive towards health, with some reporting that their apparent lack of progress is a stressor, as their current experience of food wellbeing regulation does not seem to add up to expectations. Participants often feel stressed and guilty after eating or drinking something unhealthy and express emotions that arise like “lack of self-control” (Maari, F, Young Adult, Table 4).

Emotional responses to appearance and healthful body ideals are evident in the participants’ testimonials. Physical experience, in such cases, is a locus of control for wellbeing in other aspects of life. Maari’s feelings of weakness and loss of control are diminished through goods and services used to maintain and express power.

3.3 *S for Social Embedding*

Table 5. Social Embedding in Functional Food Consumption

Functional Food	Data Excerpts
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Affordances

Positioning within systems of social context rules and norms

George related his consumption of plant sterol/stanol products to his relationship with his wife and family, and the very specific social norms and conventions that entailed for him. The main reason he consumes functional foods is because it is “*easy for my wife*”. Although his diet was excellent, and he reported that his diabetes was now virtually undetectable, he said that healthy diets were “*just too baffling*” and “*would be far too complicated for his wife to deal with on a daily basis*”. He felt it was much easier for him to feel he was doing something proactive to improve his health by eating a functional food product. He positioned himself, through consuming functional foods, as understanding the social rules and conventions associated with his age, stating that “*having Benecol in my shopping basket*” was indicative of “*being in the old-age club*”, unlike other men (particularly his brother, Marvin) who almost reveled in unhealthy eating habits despite having diabetes. George thought this was “*disgraceful*”, signaling that he understood, and followed, social rules and norms about food wellbeing regulation. (George, M, Older Adult; heart disease and diabetes; Benecol and diabetic chocolate products)

June was the purchaser of plant sterol/stanol products not the consumer as she preferred “*eating a smaller amount of real butter*”. Her view was that she wanted to “*keep George alive*”, that was her “*main priority*” – and she felt it was “*no harm buying that instead of ordinary spread*”. For her functional food purchase is an effective way to get health-giving stuff into George who if “*left to his own devices...would be quite a faddy and poor eater*” Here June is signaling that functional foods regulate her social role according to the norms relevant to her, of being a good wife. (June, F, Older Adult; no apparent issues; plant-sterol/stanol-based products)

Self-Presentation and Signaling of Goal Orientation

Tedi consumes probiotic products to balance his stomach after having too much fatty food, and discusses how healthy living provides opportunities to display goal orientation. However, he resists the idea that this *should* be visible to others. “*My kids, they put on Facebook, that they are bad person because they haven’t trained today or they had a drink this weekend and so on. It’s like, it’s some kind of, it’s lifestyle, but it’s demanding everything they are doing and it’s, like I said, like my son, he believes that I’m so interested in his training stuff, but I know that, when I was younger, when I was 20 or 30 or 25, I also, I think I was quite the same in that way that I wanted to train and look good and everything like that, but it wasn’t... it’s different today, it’s more visible.*” (Tedi, M, Middle Age; food related illness; probiotic products)

John discusses how consumption of functional foods is not coherent with his preferred self-presentation or goal signaling. John recently switched from consuming plant sterol/stanol spread to “*buying tablets from the internet*”. He felt that the tablets gave him an advantage over using a FF product, and he reported that he was “*now eating butter again*” and having “*a much better life*” as a result. Upon probing, John reported that healthy diet foods were more than a food-taste choice, although he “*loves butter*”, but also avoid signaling what he called an “*unhealthy obsession with food*” John clearly felt that visible food wellbeing regulation signaled something negative about himself. (John, M, Middle Age; moderately high cholesterol; plant-sterol/stanol-based products)

Heini articulates a clear link between the consumption of functional foods (in this case vitamin water) and self-presentation “*But if you think about you show values...social benefit, of course you signal with the product choice to others that I make these good choices, that I don’t walk around with a soft drink bottle in my hand.*” (Heini, F, Young Adult; no apparent health issues; vitamin water)

Food wellbeing has been described as a set of relationships with food, be that psychological, physical, emotional, or interpersonal, that happens at both the individual and societal levels [10]. Therefore, food wellbeing regulation generally goes beyond private experience and is influenced by the diverse social and cultural environments in which consumers are embedded (see Table 5). Segueing from the previous themes into the next, moral and emotional challenges extend into social contexts and thereby govern behavior according to acceptable norms, rules, and social roles.

3.4 H for Historicality

Table 6. Historicality of Functional Food Consumption

Functional Food Affordances	Data Excerpts
Non/Reflection on food wellbeing routines over time	<p>Mary was driven by her GP advice to start using plant sterol/stanol products. She felt that once she had started taking them it was a problem to stop, she reported she felt she had “<i>crossed a line and become a person that has Benecol</i>” (i.e., it was sign of a step across a threshold into old age that you can’t/shouldn’t step back from) She said “<i>My cholesterol is up and down but I keep taking it. It can’t harm me and it’s better to do it than leave it to chance.</i>” She argued that she felt the functional foods were “<i>like a safety net and you don’t want to take that safety net away, I’m used to it now. It’s made from plants so must be better for you than butter anyway</i>”. For Mary, using FF affords reflection on the inevitability of food wellbeing regulation over time as she ages. (Mary, F, Middle Age; type-2 diabetes; plant-sterol/stanol-based products)</p> <p>Linnea reports that using functional food affords her the ability to <i>avoid</i> reflecting on her health, “<i>I actually don’t really think about health, or maybe it’s so that when you start thinking about it you know that it’s not going that well. But it’s not something I think about, like oh it would be nice to feel a little better, I could go to a mindfulness class. Not...You think about people who are very physically focused, how it links to their mental side, what they are trying to achieve if you think about these fitness people or something, that are they patching something with it.</i>” She uses vitamin water effectively to delay or forget that health is something to be actively managed even by younger people (Linnea, F, Young Adult; no apparent health issues; vitamin water)</p> <p>George discussed how his food wellbeing regulation had changed over time, reflecting on the variance from avoiding to actively consuming for food wellbeing. He railed against the fact that functional foods were now part of his life “<i>it eventually catches up with you, when I was younger, I could eat what I liked but it will catch you up when you get to my age</i>”. Here he compared himself to his (possibly mythical) younger self, who never had to concern himself with food wellbeing regulation. (George, M, Older Adult; heart disease and diabetes; Benecol and diabetic chocolate products)</p>

Dis/Embedding of food wellbeing routines in life biography

Irma recounts the complexities of her food wellbeing regime and how using FF affords a more simple, structured and sustainable effort at food wellbeing regulation over time. *"I cannot take probiotics in the morning because it can block the thyroxin for my hyperthyroid condition from working, but then at noon or in afternoon I can. Probiotics interrupt with many medicines, they can kind of the compress or knock it out from the stomach—keep it from absorbing. So actually, I need to wait two or three hours should be waited, no, two or three hours before you shouldn't take medicine or after. However, the probiotics are more effective for, how do you say, for getting nutrition from the normal food as such and that helps the stomach condition. They make nutritional absorption from food better in the stomach. The disease can make me depressed at times and really tired, so it is important to get what I can from food to make me feel better. Plus, they are easy to take."* (Irma, F, Middle Age; hyperthyroidism; probiotic products)

Juha demonstrates how FF can complexify food wellbeing regimes *"I can show you the sour milk that I'm drinking every day, to get good bacteria, milk bacteria. So this is what we have been buying lately. So, it's sour milk and I think there's, they have added some milk bacteria, this acidofilus-bifidus and some vitamins. Those are good, for example, these days they add vitamin D, but I do not like the artificial stuff. For example, the whey powder we use, it's natural, so it doesn't have any sweeteners or anything else, whey and then some, what are these called, amino acids, I'll show that one too. I get those from the gym we go to. And it was surprising, we wanted to get a four kilo can of that, and the producer makes four kilo cans, but the gym doesn't buy the four-kilo package because pretty much no one buys those. And the natural flavor, the guy on the counter said that maybe two per cent or one per cent buys the natural one. So, everyone else gets the strawberry or chocolate or cookies and creams or something."* (Juha, M, Young Adult; weight/food related illness; probiotic products)

The theme of historicity illustrates how functional foods afford consumers food wellbeing regulation biographies over time. Here, functional foods often afford paradoxical positions vis-à-vis consumers' food wellbeing regulation biographies, developed by the entanglement of morality judgements, emotional consequences, and social roles. Food wellbeing develops through practices and values over time, and functional food might afford diametrically opposing positions. Often, some particular events or imbalances afford self-reflection and reveal certain limits or constraints to carrying out particular goals related to health. In their descriptions of health and wellbeing, participants reveal it as a performative action, something that can remain quiet in an unarticulated availability, captured by Linnea's statement "when you start thinking about it, you know that it's not going that well" (F, Young Adult, Table 6). To be overtly concentrated on health, such as fitness people, reflects weak

mental wellbeing, an attempt at “patching” (Linnea, F, Young Adult, Table 6) or compensating for something that they do not feel good about.

Health and wellbeing, food-focused or otherwise, are achieved through the logic of practice whereby consumers can use functional foods to support everyday activity. Instead of integrating a new regimen of vitamin supplements into their daily habits, consumers can utilize functional foods that integrate them into a product they already consume, such as water. Thus, consumers need to confront or struggle to change current habits, and the need to overly focus on food wellbeing regimes is reduced. Consuming functional foods becomes more non-deliberate as they become relationally constituted in a nexus of other social activities and wrap up or entangle with other practices within a participant’s consumption ecosystem. Consumers are often unaware of certain aspects of bodily experiences related to food wellbeing. To illustrate, the physical organs of the lungs are rarely the focus of our activity of breathing. Likewise, the activity of acid and enzymes in the stomach or guts is not foregrounded in our attention as we eat say an apple. For those facing extreme health challenges like hyperthyroidism, these activities are drawn into their attention through the symptoms of their disease. Functional foods, like probiotics, can assist in the unreflective actions their body takes to soak up nutrients from foods, as seen with Irma, who has lifelong and severe food intolerances, perceiving that functional foods simplify her unavoidably complex food wellbeing regulation routine. Over time, some participants, however, become immersed in (perhaps obsessed with) functional food consumption, which affords increasingly complex food wellbeing regimes like that described by Juha (M, Young Adult, Table 6). This means they become more purposive with a heightened contextual, cultural understanding that goes beyond merely adding functional foods into the daily diet as a complementary food.

4. Discussion

This study responds to calls for marketing research to better understand food wellbeing in relation to Food Design Thinking (FDT). FDT identifies food culture as one of the key elements of the definition of food design thinking, and we join this conversation though understanding the regulation of food wellbeing as it takes place in the setting of functional food consumption. We have demonstrated through the socio-material agency of functional foods (i.e., their affordances) that food wellbeing culture is complex and underpinned by paradox. Functional foods mean different things to different people depending on the social and cultural context in which they are embedded. Affordance theory allows us to analyze this complexity without reducing it to the linear or circular process often inherent in FDT discussions [11]. We subsequently progress the discussion and actualize better FDT through our conceptualization of the M.E.S.H. framework for food design and innovation. The interpretive findings above, as shown in the model (Figure 1), describe overlap and entanglement of different cultural themes and depict a mesh or fabric that weaves together consumers' perceived affordances for food wellbeing through functional foods.

Figure 1. Weaving the fabric of the M.E.S.H. Framework

[insert figure 1 here]

Applying affordance theory, our data show different possibilities for action that hinge on the food-product innovation of functional foods. We evidence, through our data, that the differences in affordances should not be seen as isolated into their respective themes, but rather seen as “multiple formations of overlapping and sometimes contradictory material-semiotic entanglements of stories, bodies and objects”[12]. Effectively what emerges from the themes of functional food consumption, *vis-à-vis* food wellbeing regulation, is an array of dichotomous cultural affordances—*communal* vs *competitive* and *inert* vs *agentic*—that

compete amidst the complexity of the practical and material environment in which food innovations are embedded.

To further elaborate on the overlap in the fabric of the M.E.S.H. framework, we draw out these competing and contradictory cultural affordances, wrought between consumers and functional foods, embedded within social, and cultural milieu (see Figure 1). *Agentic* cultural affordances give possibilities for active engagement with food wellbeing regulation, as a key driver of food wellbeing regulation lifestyles. Here, functional foods offer action possibilities for active engagement in food wellbeing regulation, where consumers make food wellbeing overtly, and often visibly, part of their daily lives and routines. This agentic food wellbeing regulation affordance suggests underpinning values that often make consumption more conspicuous, whereby the market for functional foods provide possibilities for identity construction[13]. These cultural forces seem to add variation to the M.E.S.H. framework when compared to *inert* affordances. Here, functional foods afford consumers possibilities for a more passive engagement with food wellbeing regulation.

With an emphasis on well-being, the increasing importance of nutrition and lifestyle interventions as an adjunct to medical practice has attracted considerable attention in today's health care landscape, but critical issues remain [14]. Despite the increasing popularity of nutrition to reduce diet-related diseases, there has been an annual increase in noncommunicable diseases such as obesity, cardiovascular disease, cancer, respiratory disease, and even diabetes worldwide [15]. Existing solutions to these problems tend to focus on opposite ends of a spectrum. Some focus on food composition and products like functional foods that address disease symptoms but underestimate the role of culture in food consumption [16, 17], while others focus on consumer education to get people to adopt food innovations that improve health and well-being [18], but that means more work for an already anxious and exhausted workforce [19, 20]. We have found a solution that connects the two

ends of the spectrum by developing our M.E.S.H. framework for healthcare leadership and management, which helps integrate food innovation into people's daily lives in the design healthy food experiences.

5. Conclusion

This paper offers three interconnected contributions in the context of health leadership and management: a comprehensive empirical understanding of the cultural and social life of functional foods within consumer food wellbeing regulation; the theoretical development of a unique combination of affordance theory, consumption experience, and FDT thinking to form an integrative framework (M.E.S.H.) for analyzing other innovations; and the realization that food wellbeing cannot be solely achieved through FDT but emerges from a relational interplay of cultural affordances mediated by food innovations. The central contribution of this work is the M.E.S.H. framework for food design thinking, a model that guides the integration of cultural affordances of food wellbeing regulation into a more refined food design thinking approach.

Utilizing the M.E.S.H. framework, we propose a foundation for researchers, policymakers, and marketers interested in exploring the intricacies of food wellbeing regulation and incorporating the cultural and social complexities into their food design thinking and innovation processes, while prioritizing consumer experiences. This focus on health leadership and management ensures that food wellbeing remains at the forefront of decision-making and innovation within the food industry.

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