

Review Article

Mind-Sets in Brazil Regarding the Perceptions of Stevia and Sucralose to Replace Sugar in Food: Using Generative AI and Mind Genomics Thinking to Generate Hypotheses and Insights

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Abstract

The paper presents the use of generative AI to explore the mind-sets of consumers in Brazil regarding the increasing use of high potency sweeteners. Through simulation and synthesis by AI, the paper shows how to generate deep knowledge regarding the mind-sets, how to simulate a town-hall question and answer session with these mind-sets, and what happens when these mind-sets go shopping (shop-along). The depth of insight generated by AI provides the researcher with an opportunity to explore a topic, to create hypotheses, and to discover areas that were not discovered before, all in a matter of hours. The paper recognizes the need for empirical validation of the results but shows the power of generative AI to “educate” the reader on a topic, viz., almost a step that might be called “pre-validation education.”

Keywords: Generative AI; Mind genomics; Mind-sets in Brazil; Simulated; Sweeteners; Synthesized mind-sets

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Abbreviations

AI: Artificial Intelligence;

ChatGPT: Chat Generative Pre-trained Transformer;

LLM: Large Language Model.

Introduction

During the early 20th century, people started to worry about the potential health consequences of consuming excessive amounts of sugar, as it became more and more common in processed foods. Researchers and health professionals explored alternative sweeteners which could offer the same level of taste satisfaction while minimizing negative health impacts. As a result, so-called “artificial sweeteners” emerged, the first one being saccharin, discovered in the 19th century by chemists Remsen and Fahlberg [1], then other high potency chemicals such as the cyclamates [2], etc. These sweeteners were incredibly potent, low in calories, and delivered the required sweetness. These chemicals were not “incredibly sweet,” but rather “incredibly potent,” delivering the same degree of perceived sweetness and low concentrations, no calories, but often with a side-taste.

Artificial sweeteners gained immense popularity during the mid-20th century as food companies eagerly embraced their use in various products. People were attracted to the concept of indulging in delicious treats without worrying about the extra calories, at about the calories of the sweetener being replaced. Nevertheless, the safety and potential side effects of these sweeteners started to raise concerns, sparking debates among both scientists and consumers. Regardless of these concerns, the industry persevered in its pursuit of developing new and enhanced artificial sweeteners worldwide. Brazil, the topic of this paper, was not an exception [3,4].

The ongoing discussion surrounding the safety and health effects of artificial sweeteners remains a topic of contention, with a plethora of conflicting studies and varying viewpoints [5-9]. There is a debate among experts regarding the impact of these sweeteners on calorie intake and obesity. Some argue that they can be beneficial, whereas others express concerns about their potential negative effects on metabolism and gut health. Consumers are faced with the challenge of navigating a complex landscape of competing information, as they strive to make informed choices for their health and well-being. With the constant development and marketing of new sweeteners, the discussion surrounding the incorporation of high potency sweeteners in food is bound to change over time.

Using Generative AI to “Explore” Mind-Sets and Opportunities in Brazil

In Brazil, the adoption of high potency sweeteners mirrored the global trend. As the Brazilian market became flooded with processed foods and sugary beverages, there emerged a need for healthier options to replace traditional sweeteners. Consequently, companies in Brazil started delving into the realm of artificial sweeteners, aiming

to appeal to health-conscious consumers. Stevia, a natural sweetener with zero calories, has had a significant impact on the transition away from sucrose in Brazilian foods. One possible reason is that the Stevia plant is cultivated in Brazil [10].

With this increasing focus on high potency sweeteners in Brazil has come the opportunity to explore how the Brazilian consumer “thinks” about these sweeteners. At the same time, the rapid and exciting emergence of generative AI, these so-called LLMs (large language models), open up the opportunity to use the AI as a tool for learning. Could one use generative AI to explore through simulation and synthesis the different aspects thinking about high potency sweeteners, focusing only on Brazil?

Generative AI has the ability to revolutionize the way we understand the mind-sets of Brazilian consumers when it comes to high potency sweeteners. By utilizing this technology, researchers can simulate interviews, stories, and even town hall meetings to gain insight into the thoughts and preferences of consumers in Brazil regarding artificial sweeteners. This approach allows for a deeper understanding of consumer behavior, attitudes, and motivations surrounding high potency sweeteners.

One of the key advantages of using generative AI to understand consumer mind-sets is the ability to simulate a wide range of scenarios and interactions. By creating virtual interviews and town hall meetings, researchers can gather data on consumer perceptions and opinions in a controlled environment. This allows for a more accurate representation of consumer attitudes towards high potency sweeteners, leading to more informed decision-making in the industry. Furthermore, generative AI can be used to synthesize and simulate the responses of consumers in these virtual scenarios. By analyzing the data collected from simulated interviews and town hall meetings, researchers can gain valuable insights into consumer preferences, concerns, and beliefs regarding high potency sweeteners. This information can then be used to tailor marketing strategies and product development to better meet the needs of Brazilian consumers.

In essence, generative AI provides a unique opportunity to delve into the minds of Brazilian customers and gain a comprehensive understanding of their thoughts and attitudes towards high potency sweeteners. By simulating interactions and conversations, researchers can uncover hidden insights and trends that may not be readily apparent through traditional research methods. This technology has the potential to revolutionize market research and enhance the way companies approach consumer engagement and product development [11,12].

Generative AI and the Creation of Questions for Exploration

The power of generative AI to focus attention on a topic, as well as to expand the horizons, comes through from the two sets of 15 questions each, shown in table 1 (questions 1-15, questions 16-30, respectively). The two sets of 15 questions required no more than 10 seconds each for the generative AI to create, using the Mind Genomics platform, BimiLeap.com. The instructions to the underlying generative AI were simple: “I am focusing on the use of generative AI to understand how the Brazilian consumer might think about high potency sweeteners.” Table 1 shows the questions exactly as they emerged from the generative AI, ChatGPT 3.5.

What are the key factors driving Brazilian consumers to consider using high potency sweeteners?

1. How do Brazilian consumers perceive the health benefits of high potency sweeteners compared to natural sweeteners?
2. What are the main concerns Brazilian consumers have regarding the safety of high potency sweeteners?
3. How do Brazilian consumers perceive the taste and flavor of products sweetened with high potency sweeteners?
4. What are the pricing expectations of Brazilian consumers for products containing high potency sweeteners?
5. How influential are marketing and advertising strategies in shaping Brazilian consumers' perceptions of high potency sweeteners?
6. How do Brazilian consumers compare the environmental impact of high potency sweeteners versus traditional sweeteners?
7. What are the preferred forms of packaging for products containing high potency sweeteners among Brazilian consumers?
8. How do Brazilian consumers incorporate high potency sweeteners into their daily diets and routines?
9. What are the main sources of information Brazilian consumer's trust when researching high potency sweeteners?
10. How do Brazilian consumers perceive the availability and accessibility of products containing high potency sweeteners in the market?
11. What role do cultural and societal norms play in shaping Brazilian consumers' attitudes towards high potency sweeteners?
12. How do Brazilian consumers view the role of high potency sweeteners in addressing health concerns such as obesity and diabetes?
13. What are the potential barriers that prevent Brazilian consumers from adopting products sweetened with high potency sweeteners?
14. What are the key opportunities for companies to educate and inform Brazilian consumers about the benefits of high potency sweeteners?
15. What factors do Brazilian consumers consider when choosing high potency sweeteners over traditional sugar?
16. How do Brazilian consumers perceive the health benefits of high potency sweeteners compared to sugar?
17. Are Brazilian consumers more concerned about the taste or the health implications of high potency sweeteners?
18. What are the main reasons driving Brazilian consumers to choose high potency sweeteners?
19. How important is price in the decision-making process for Brazilian consumers when choosing high potency sweeteners?
20. Do Brazilian consumers trust the safety of high potency sweeteners over sugar?
21. How do Brazilian consumers perceive the environmental impact of high potency sweeteners compared to sugar?
22. Are there cultural preferences or taboos that influence the acceptance of high potency sweeteners among Brazilian consumers?
23. What role does marketing play in shaping Brazilian consumers' perception of high potency sweeteners?
24. How do Brazilian consumers educate themselves about the benefits and drawbacks of high potency sweeteners?
25. Are Brazilian consumers more likely to use high potency sweeteners in certain food or drink categories?
26. Do Brazilian consumers have concerns about potential side effects or long-term health risks associated with high potency sweeteners?
27. How do Brazilian consumers balance taste preferences with health considerations when choosing high potency sweeteners?
28. Are there specific demographic or psychographic segments within the Brazilian market that are more receptive to high potency sweeteners?
29. What are the most common misconceptions or misunderstandings Brazilian consumers have about high potency sweeteners?

Table 1: Two sets of 15 questions each about the perception of high potency sweeteners by the Brazilian customer, created using the Mind Genomics platform, BimiLeap.com.

Mind Genomics Thinking and the Search for Mind-Sets in Brazil

The way individuals perceive and assign importance to information on specific subjects, e.g., high potency sweeteners in Brazil, is heavily influenced by their mind-sets. Our perspectives are influenced by a variety of factors, such as our personal beliefs, values, life experiences, and cultural background. These factors greatly influence our comprehension and assessment of information. It is important to consider that certain individuals place a high value on their well-being and may have reservations about consuming artificial sweeteners. On the other hand, there are people who value simplicity and prioritize flavor above everything else.

Exploring the various perspectives on high potency sweeteners in Brazil allows businesses to customize their communication and product offerings to cater to the wide array of consumer preferences. This can assist businesses in effectively navigating cultural nuances and ensuring that their products resonate with their target audience. In addition, delving into various perspectives can offer valuable insights into consumer behavior, enabling companies to predict trends and make well-informed decisions regarding marketing strategies.

In Brazil, there is a diverse range of perspectives and mind-sets regarding high potency sweeteners. These mind-sets, in turn, influence consumer preferences and buying choices. Would you like to explore the realm of artificial sweeteners? Opinions on the matter differ, with some individuals viewing them as a better option than sugar for health reasons, while others express apprehension about potential long-term consequences. Understanding different perspectives is crucial for businesses to address consumer concerns, clarify any misunderstandings, and effectively promote the advantages of potent sweeteners.

Investigating the perceptions of high potency sweeteners in Brazil can provide companies with a valuable approach to establish trust, loyalty, and brand credibility among consumers. Understanding the various viewpoints and preferences of different consumer segments enables businesses to create marketing strategies that truly connect with their intended audience. In addition, examining various viewpoints can give businesses a competitive edge, enabling them to adjust to shifting consumer tastes and foster innovation in the constantly evolving food and beverage sector.

Table 2 shows the instructions given to the generative AI to synthesize mind-sets relating to Sucralose and to Stevia, respectively. Note that in table 2, no information is provided about the two sweeteners, nor about the number of mind-sets, and of course nothing about the nature of these mind-sets. All that is requested is the name of the mind-set and answers to 13 questions. Tables (3A-3D) show that the request to generate mind-sets ended up with four clearly different mind-sets. The actual number of mind-sets were more, but the later mind-sets were not clearly relevant, and are not shown.

Methodological note: There is no “memory” in the generative AI (ChatGPT 3.5) used by BimiLeap.com, the Mind Genomics platform. Thus, when the request is provided as shown in table 2, each iteration returns with a separate mind-set. Quite often the same mind-set may return a second and a third time, respectively. To prevent this repetition, the instructions to the AI are amended for each iteration, with the instructions not to return with a mind-set already delivered in a previous iteration.

Give me information for each mind-set regarding the way people in Brazil think about Sucralose and Stevia. The mind-sets can like one, but not the other, or may like both.

For each mind-set answer each question below in detail regarding Brazil only.

Here are the questions:

1. **PATTERNS:** What patterns of likes define the mind-set?
2. **ORIGIN:** How did the mind-set come to be?
3. **THOUGHTS REGARDING SWEETENERS IN FOODS:** How does the mind-set react to high potency sweeteners in food?
4. **QUOTES WHEN TALKING TO FRIENDS:** When the mind-set talks to friends about high potency sweeteners, what are six things that the mind-set says? Make sure these are quotes and represent what the mind-set says.
5. **WHO IS IN THE MIND-SET:** Who are in the mind-sets, in terms of gender, age, income, education, family structure?
6. **FOODS SERVED AT HOME:** What is the type of food that the mind-set serves at home, and why?
7. **SHOPPING THOUGHTS:** When the mind-set goes shopping, what does the mind-set think about in an active way? What are the real thoughts of the mind-set, not just the ordinary thoughts?
8. **DESCRIBING THE FOOD INDUSTRY:** How does the mind-set describe the food industry in Brazil, and why does it describe it that way?
9. **TALKING TO CHILDREN:** When the mind-set talks to its children about food, what does it say, and why?
10. **VISIBILITY TO THE FOOD INDUSTRY:** Is the food industry aware of this mind-set, and if so, what does the food industry do to get this mind-set's business?
11. **SLOGANS REGARDING FOOD:** What are four slogans which emblemize this mind-set in terms of its general view of food and nutrition?
12. **SLOGANS REGARDING SWEETENERS:** What are four slogans which emblemize this mind-set in terms of its view of high potency sweeteners?
13. **HEALTH ISSUES:** What health issues does this mind-set suffer from which might impact on how it feels about high potency sweeteners?

Table 2: The instructions provided to the generative AI to create different mind-sets about Sucralose and Stevia, the two high potency sweeteners of greatest interest in Brazil as of the time of the research (spring, 2024).

How the Mind-Sets Deal with Questions from Industry: Simulating and Synthesizing a Town Hall Meeting

Generative AI can be used to simulate Brazil's food industry's mind-sets in town hall meetings, providing valuable insights into stakeholders' attitudes and perspectives. This can help companies customize strategies and communication, identify common themes, and identify areas for improvement. The AI-generated commentary can also spark innovative thoughts and fresh ideas, leading to more effective communication and decision-making within the industry. This innovative approach can spark new ideas and strategies.

Table 4 shows the instructions provided to the generative AI through Idea Coach in BimiLeap.com. The instructions clearly state the four members of the panel and the 11 parts of the answer to be provided for each question. Tables (5A-5E) show five questions generated by the AI, and the 11 answers to each question. The possibility exists to generate 100+ questions in any topic through the Mind Genomics platform, and then submit each question to the analysis shown in table 4 and tables (5A-5E). Only space considerations limit the number of questions considered.

A. SUCRALOSE LOVERS

- PATTERNS:** This mind-set enjoys the taste of sucralose and believes it is a better alternative to sugar. They may dislike stevia due to its aftertaste or perceived health implications.
- ORIGINS:** The mind-set may have developed from exposure to sucralose in products marketed as healthier alternatives to sugar in Brazil.
- THOUGHTS REGARDING SWEETENERS IN FOODS:** This mind-set reacts positively to high potency sweeteners in food, believing sucralose to be a beneficial substitute for sugar.
- QUOTES WHEN TALKING TO FRIENDS:** "Sucralose is the perfect sweetener for me, I love the taste!" "I avoid stevia because it tastes too bitter for my liking." "High potency sweeteners like sucralose have helped me cut down on my sugar intake." "I find sucralose to be a great addition to my morning coffee." "Sucralose is the best option for maintaining my weight." "Stevia just doesn't appeal to me like sucralose does."
- WHO IS IN THE MIND-SET:** This mind-set may consist of individuals who are health-conscious, middle-aged or older, with moderate to high incomes, higher levels of education, and possibly a family structure with children or grandchildren.
- FOODS SERVED AT HOME:** This mind-set serves food at home that is low in sugar, opting for products sweetened with sucralose to maintain a healthier lifestyle.
- SHOPPING THOUGHTS:** When shopping, this mind-set actively considers the ingredients of products to ensure they contain sucralose instead of sugar, focusing on maintaining a balanced diet.
- DESCRIBING THE FOOD INDUSTRY:** This mind-set views the food industry in Brazil as innovative for incorporating high potency sweeteners like sucralose into products to cater to health-conscious consumers.
- TALKING TO CHILDREN:** When talking to children about food, this mind-set emphasizes the benefits of choosing products with sucralose for better health and weight control.
- VISIBILITY TO THE FOOD INDUSTRY:** The food industry may be aware of this mind-set and may promote products sweetened with sucralose to appeal to their preferences.
- SLOGANS REGARDING FOOD:** "Sucralose is the sweetener for a healthy lifestyle." "Choose sucralose for a sweeter future." "Sucralose: the taste of health." "Sweeten your world with sucralose."
- SLOGANS REGARDING SWEETENERS:** "Say no to stevia, yes to sucralose for a better taste." "Sucralose: the sweetest choice for your health." "Embrace sucralose, say goodbye to sugar." "Taste the difference with sucralose over stevia."
- HEALTH ISSUES:** This mind-set may suffer from weight control issues due to a preference for sweet foods, impacting their attitudes towards high potency sweeteners and their focus on maintaining a healthier diet.

Table 3A: Profile of the Sucralose Lover mind-set.

B. STEVIA SUPPORTERS

- PATTERNS:** Prefer natural sweeteners, concerned with health, prefer plant-based alternatives
- ORIGIN:** This mind-set came to be due to a growing trend towards natural and organic products in Brazil, as well as an increased awareness of health and wellness.
- THOUGHTS REGARDING SWEETENERS IN FOODS:** The Stevia Supporters react positively to high potency sweeteners in food, especially if they are plant-based like Stevia, as they see them as a healthier alternative to artificial sweeteners.
- QUOTES WHEN TALKING TO FRIENDS:** "Stevia is a natural sweetener derived from plants, much better than artificial alternatives." "I only use Stevia in my coffee and baking, it is so much healthier." "I avoid high potency sweeteners with artificial ingredients, they're bad for you." "Stevia is a great option for anyone looking to cut back on sugar without sacrificing taste."
- WHO IS IN THE MIND-SET:** In terms of gender, age, income, education, and family structure, Stevia Supporters are typically females aged 25-45 with middle to high income levels, higher education, and family-oriented lifestyles.
- FOODS SERVED AT HOME:** The type of food that the Stevia Supporters serve at home is typically organic, plant-based, and free from artificial additives, as they prioritize health and wellness in their diet.
- SHOPPING THOUGHTS:** When Stevia Supporters go shopping, they actively think about reading labels and ingredient lists to ensure they are selecting natural, plant-based products, and avoiding artificial additives.
- DESCRIBING THE FOOD INDUSTRY:** The Stevia Supporters describe the food industry in Brazil as moving towards more natural and organic products, as there is a growing demand for healthier options in the market.
- TALKING TO CHILDREN:** When Stevia Supporters talk to their children about food, they emphasize the importance of choosing natural, plant-based alternatives and avoiding artificial ingredients for better health and wellness.
- VISIBILITY TO THE FOOD INDUSTRY:** The food industry is aware of the Stevia Supporters mind-set and caters to their preferences by offering more natural, plant-based products and highlighting the health benefits of Stevia as a sweetener.
- SLOGANS REGARDING FOOD:** "Nature's sweetness for a healthier you." "Choosing plant-based for a better tomorrow." "Empower your health with Stevia." "Real ingredients, real flavor, real health."
- SLOGANS REGARDING SWEETENERS:** "Stevia: Naturally sweet, naturally healthy." "Say no to artificial sweeteners, choose Stevia." "Plant-based sweetness for a healthier lifestyle." "Sweeten your life the natural way with Stevia."
- HEALTH ISSUES:** Stevia Supporters may suffer from health issues related to sugar consumption, such as diabetes or obesity, which impact how they feel about high potency sweeteners and drive them towards more natural alternatives like Stevia.

Table 3B: Profile of the Stevia Supporter mind-set.

C. SWEETENER DECIDERS

1. **PATTERNS:** This mind-set is characterized by being open to trying new sweeteners but ultimately making a decision based on taste and perceived health benefits.
2. **ORIGINS:** This mind-set evolved from a combination of health-conscious individuals and food enthusiasts looking for alternatives to sugar.
3. **THOUGHTS REGARDING SWEETENERS IN FOODS:** Sweetener Deciders are receptive to high potency sweeteners in food as long as they taste good and are perceived as safe.
4. **QUOTES WHEN TALKING TO FRIENDS:** "I prefer natural sweeteners over artificial ones." "I always check the ingredient list for sweeteners before buying a product." "I don't mind high potency sweeteners as long as they don't have a chemical aftertaste." "Using natural sweeteners like honey or maple syrup is better for you." "I like to experiment with different sweeteners in my baking." "I avoid products with synthetic sweeteners altogether."
5. **WHO IS IN THE MIND-SET:** Sweetener Deciders are typically younger adults with higher income and education levels, with a focus on health and wellness. They may be single or in smaller families.
6. **FOODS SERVED AT HOME:** Sweetener Deciders tend to serve whole, minimally processed foods at home to support their health-conscious lifestyle.
7. **SHOPPING THOUGHTS:** When shopping, Sweetener Deciders actively consider the impact of sweeteners on their health and seek out products that align with their preferences for natural ingredients.
8. **DESCRIBING THE FOOD INDUSTRY:** The mind-set views the food industry in Brazil as focused on mass production and profit, often sacrificing quality and health benefits for convenience and affordability.
9. **TALKING TO CHILDREN:** Sweetener Deciders educate their children about the importance of making informed choices about food, including the types of sweeteners used and their potential impact on health.
10. **VISIBILITY TO THE FOOD INDUSTRY:** The food industry is aware of Sweetener Deciders and markets products that cater to their preference for natural, health-focused ingredients.
11. **SLOGANS REGARDING FOOD:** "Nature's sweetness is the best." "Good taste, better health." "Choose wisely, sweeten wisely." "Quality over quantity, always."
12. **SLOGANS REGARDING SWEETENERS:** "Made by nature, not in a lab." "When sweet meets healthy." "Taste the difference, feel the difference." "Feed your body right, sweeten it light."
13. **HEALTH ISSUES:** Sweetener Deciders may suffer from conditions such as diabetes or obesity, leading them to be more cautious about their sugar intake and preference for alternative sweeteners.

Table 3C: Profile of the Sweetener Deciders mind-set.

D. HEALTHY LIVING ENTHUSIASTS

1. **PATTERNS:** Whole foods, natural ingredients, organic products
2. **ORIGINS:** This mind-set developed from a growing awareness of the importance of nutrition and health.
3. **THOUGHTS REGARDING SWEETENERS IN FOODS:** They prefer using natural alternatives to sweeten their food.
4. **QUOTES WHEN TALKING TO FRIENDS:** "Quotes: "I only buy organic products for my family." "I avoid processed foods as much as possible." "I prioritize whole foods in my diet." "I believe in the power of natural ingredients." "I am conscious of what I put into my body." "I want to provide the best for my family's health."
5. **WHO IS IN THE MIND-SET:** Typically middle-aged adults, with higher income levels, higher education, and a focus on a healthy lifestyle
6. **FOODS SERVED AT HOME:** They serve mostly whole foods and organic produce at home to promote a healthy and natural diet.
7. **SHOPPING THOUGHTS:** When shopping, they actively think about the origins of products, their nutritional values, and the presence of artificial additives in food.
8. **DESCRIBING THE FOOD INDUSTRY:** They see the food industry in Brazil as needing improvement in terms of transparency and health standards, focusing on more natural and organic options.
9. **TALKING TO CHILDREN:** They educate their children about the importance of nutrition, opting for natural and whole foods for their well-being.
10. **VISIBILITY TO THE FOOD INDUSTRY:** The food industry targets this mind-set by promoting organic, natural, and healthy products, aligning with their preferences.
11. **SLOGANS REGARDING FOOD:** Slogans: "Eat well, live well." "Nature nourishes." "Health is wealth." "Nutrition is the key to vitality."
12. **SLOGANS REGARDING SWEETENERS:** Slogans: "Choose nature's sweetness." "Say no to artificial additives." "Embrace natural sweetness." "Sweeten life the natural way."
13. **HEALTH ISSUES:** Common health issues: They prioritize preventative health measures to avoid issues related to unhealthy eating habits and artificial additives commonly found in processed foods.

Table 3D: Profile of the Healthy Living Enthusiasts mind-set.

In a town hall meeting in São Paulo sponsored by the association of food manufacturers in Brazil, representatives of the four mind-sets of consumers were invited to answer questions from manufacturers about their attitudes towards food. The four representatives were:

1. The Stevia Supporter
2. The Sucralose Lover
3. The Sweetener Decider
4. The Healthy Living Enthusiast

The purpose of the meeting was to begin a dialog between the consumer and the food industry, a dialog where the food industry could ask good questions from consumers, in public, so that the food industry could move forward in Brazil.

This town hall meeting was successful. The format was that a person from the food industry would ask a question. Each of the four members of the panel would then take a turn answering the question.

Think of a question that would be asked by a person in the audience, someone in the food industry.

1. **WHO ASKED:** Who is the person asking the question? What industry, what job in industry, what experience?
2. **WHY ASKED:** Why did the person ask this question?
3. **STEVIA SUPPORTER THINKS:** What does the Stevia Supporter think privately, and then what does the Stevia supporter say publicly and why?
4. **SUCRALOSE LOVER THINKS:** What does the Sucralose Lover think privately, and then what does the Sucralose lover say publicly, and why?
5. **SWEETENER DECIDER THINKS:** What does the Sweetener Decider think privately, and then what does the Sweetener Decider say publicly, and why?
6. **HEALTHY LIVING ENTHUSIAST THINKS:** What does the Healthy Living Enthusiast think privately, and then what does the Healthy Living Enthusiast say publicly, and why?
7. **BRAZIL BUSINESS PRESS:** What is the general “take away” from this question that will be written up in the Brazil business press? What are two slogans that the business press used to describe the questions and answers?
8. **BRAZIL INSTITUTE OF FOODS:** What is the general “take away” from this question that will be written up in the Brazil “report from the Brazil Institute of Foods?” What are two slogans that the science press used to describe the questions and answers?
9. **BRAZIL BUSINESS COMMUNITY:** How satisfied is the Brazil business community with the answer in terms of which answers were useful, and which answers were simply nonsense?
10. **STUDENT REACTIONS:** In a paragraph of six sentences, how did the students attending who were from the university studying Brazilian food science and food technologies describe this particular question and answer interchange? Use their own words. Use quotes to summarize their feelings.
11. **FOOD POLICY OUTCOME:** What is the outcome of this question in terms of food policy in Brazil, if there is any?

Table 4: The specifications for the “town hall meeting” provided to generative AI, along with the format of the answers to each question.

QUESTION A: WHAT DO YOU BELIEVE IS THE MOST EFFECTIVE SWEETENER FOR PROMOTING HEALTH AND WELLNESS IN OUR FOOD PRODUCTS?

1. **WHO ASKED:** Marketing director at a major food manufacturing company in Brazil with 15 years of experience in the industry
2. **WHY ASKED:** Gain insight on which sweetener consumers value the most and to understand consumer preferences for future product development
3. **STEVIA SUPPORTER THINKS:** That Stevia is the most natural and healthy sweetener option. Publicly, the Stevia supporter emphasizes the benefits of Stevia in promoting a healthier lifestyle and reducing sugar intake.
4. **SUCRALOSE LOVER THINKS:** Privately prefers Sucralose for its taste and versatility. Publicly, the Sucralose lover highlights the convenience and wide availability of Sucralose in various food products.
5. **SWEETENER DECIDER THINKS:** Weighs the pros and cons of different sweetener options based on consumer feedback and market trends. Publicly, the Sweetener Decider emphasizes the importance of consumer choice and variety in sweetener options.
6. **HEALTHY LIVING ENTHUSIAST THINKS:** Prioritizes natural and organic sweeteners for optimal health. Publicly, the Healthy Living Enthusiast advocates for transparency in labeling and promoting whole foods over artificial sweeteners.
7. **BRAZIL BUSINESS PRESS:** Praises the panel for their diverse perspectives on sweeteners, describing the discussion as “A Sweet Debate: Exploring the Best Sweetener Options for Health-Conscious Consumers” and “Industry Insights: The Future of Sweeteners in Brazil’s Food Market.”
8. **BRAZIL INSTITUTE OF FOODS:** Highlights the importance of consumer preferences in shaping food product development, with slogans like “From Stevia to Sucralose: The Science Behind Sweeteners” and “Healthy Living in Focus: Exploring Sweetener Choices in Brazil.”
9. **BRAZIL BUSINESS COMMUNITY:** Satisfied with the answers provided, as they gained valuable insights on consumer preferences and market trends. The panelists provided practical and informative responses that will inform future business strategies in the food industry.
10. **STUDENT REACTIONS:** Were in awe of the panel’s diverse perspectives on sweeteners. One student remarked, “It was fascinating to see how each panelist brought a unique viewpoint to the table, making us rethink our own assumptions about sweeteners in food products.” Another student added, “The discussion opened our eyes to the complexities of consumer preferences and the importance of considering multiple perspectives in product development.”
11. **FOOD POLICY OUTCOME:** May lead to a shift in food policy in Brazil towards promoting healthier sweetener options and increased transparency in labeling. Food manufacturers may prioritize natural and organic sweeteners in their products to cater to the growing demand for health-conscious options.

Table 5A: Answers to the question regarding the most effective sweetener for health and wellness.

QUESTION B: WHAT ARE THE IMPLICATIONS OF THE INCREASING USE OF SWEETENERS IN BRAZILIAN FOOD PRODUCTS?

1. **WHO ASKED:** The question is asked by an executive from a leading food manufacturing company in Brazil who is responsible for product development and marketing strategies.
2. **WHY ASKED:** The person asks this question to understand the current trends in consumer preferences and attitudes towards sweeteners.
3. **STEVIA SUPPORTER THINKS:** Natural sweeteners like Stevia are the best option for health-conscious consumers. The Stevia supporter publicly emphasizes the benefits of using Stevia as a natural alternative to artificial sweeteners.
4. **SUCRALOSE LOVER THINKS:** Privately prefers the taste and convenience of artificial sweeteners like Sucralose. The Sucralose lover publicly advocates for the use of Sucralose in food products due to its taste and shelf stability.
5. **SWEETENER DECIDER THINKS:** Weighs the pros and cons of different sweeteners to make informed decisions. The Sweetener Decider publicly emphasizes the importance of choosing the right sweetener based on consumer preferences and health considerations.
6. **HEALTHY LIVING ENTHUSIAST THINKS:** Values organic and whole food options over processed sweeteners. The Healthy Living Enthusiast publicly encourages the food industry to prioritize natural and healthy ingredients in their products.
7. **BRAZIL BUSINESS PRESS:** Focuses on the importance of understanding consumer preferences and health concerns when choosing sweeteners for food products. Two slogans used are “Balancing Taste and Health” and “Navigating the Sweetener Landscape.”
8. **BRAZIL INSTITUTE OF FOODS:** Ongoing debate between natural and artificial sweeteners in food products. Two slogans used are “Sweetening the Conversation” and “From Sugar to Science.”
9. **BRAZIL BUSINESS COMMUNITY:** Satisfied with the answers that highlight the importance of consumer choice and health considerations in sweetener usage, while dismissing answers lacking scientific support or consumer insights as nonsense.
10. **STUDENT REACTIONS:** Described this question-and-answer interchange as “an eye-opening discussion on the impact of sweeteners on consumer health and product innovation.” They summarized their feelings by saying, “We now understand the complexities of choosing the right sweeteners for food products and the importance of aligning with consumer preferences.”
11. **FOOD POLICY OUTCOME:** May lead to increased regulations on sweetener usage, as well as a focus on promoting natural and healthy sweetener options in food products.

Table 5B: Answers to the question regarding the implications for the increasing use of sweeteners.

QUESTION C: HOW DO YOU SEE THE USE OF SWEETENERS IN FOOD EVOLVING IN BRAZIL IN THE COMING YEARS?

1. **WHO ASKED:** Director of marketing from a major food manufacturing company with 10 years of experience in the industry
2. **WHY ASKED:** Gain insights into consumer preferences and trends regarding sweeteners in Brazil
3. **STEVIA SUPPORTER THINKS:** Natural sweeteners are the healthiest option, but publicly emphasizes the benefits of Stevia as a natural sweetener with no calories.
4. **SUCRALOSE LOVER THINKS:** Prefers the taste of artificial sweeteners but publicly highlights the advantages of Sucralose for calorie-conscious consumers
5. **SWEETENER DECIDER THINKS:** Assesses the pros and cons of different sweeteners but publicly emphasizes the importance of consumer choice and variety
6. **HEALTHY LIVING ENTHUSIAST THINKS:** Advocates for minimizing sugar intake but publicly promotes the use of natural sweeteners and healthy eating habits
7. **BRAZIL BUSINESS PRESS:** Focuses on importance of understanding consumer preferences in sweeteners in Brazil, with slogans like “Sweetening the future of Brazilian food” and “Navigating the sweetener landscape in Brazil.”
8. **BRAZIL INSTITUTE OF FOODS:** Reports on the consumer-driven trends in sweeteners, with slogans like “Deciphering Brazil’s sweetener preferences” and “Analyzing the choices in Brazilian sweeteners.”
9. **BRAZIL BUSINESS COMMUNITY:** Satisfied with the diverse perspectives provided, finding the answers informative and insightful.
10. **STUDENT REACTIONS:** Described the question-and-answer interchange as “eye-opening” and “insightful,” with one student saying, “It was fascinating to see how different consumer mind-sets can influence the use of sweeteners in food.”
11. **FOOD POLICY OUTCOME:** May involve a focus on offering a variety of sweetener options to cater to different consumer preferences and health goals.

Table 5C: Answers to the question regarding the evolving use of sweeteners in the coming years.

QUESTION D: WHAT CONSIDERATIONS SHOULD FOOD MANUFACTURERS IN BRAZIL TAKE INTO ACCOUNT WHEN DECIDING WHICH SWEETENERS TO USE IN THEIR PRODUCTS?

1. **WHO ASKED:** The person asking the question is a senior executive at a prominent food manufacturing company in Brazil, with years of experience in the industry.
2. **WHY ASKED:** The person asked this question to understand the preferences and concerns of consumers regarding sweeteners.
3. **STEVIA SUPPORTER THINKS:** Natural sweeteners are the healthiest option, but publicly states that a balanced approach to sweeteners is important to cater to different consumer preferences and health needs
4. **SUCRALOSE LOVER THINKS:** Artificial sweeteners are the most effective at enhancing taste, but publicly acknowledges the importance of considering consumer health concerns and preferences
5. **SWEETENER DECIDER THINKS:** Values cost-effectiveness and production efficiency in selecting sweeteners, but publicly expresses a commitment to finding a balance between functionality, taste, and health considerations
6. **HEALTHY LIVING ENTHUSIAST:** Prioritizes organic, natural sweeteners for a healthy lifestyle, but publicly emphasizes the importance of transparent labeling and consumer education on sweeteners.
7. **BRAZIL BUSINESS PRESS:** Reports on the need for food manufacturers to navigate the complex landscape. Highlights the focus on sweeteners to meet consumer demands, with slogans like “Balancing Taste and Health” and “Sweetening the Conversation.”
8. **BRAZIL INSTITUTE OF FOODS:** Underscores the importance of research and collaboration in understanding the impact of sweeteners on consumer health, with slogans like “Science-Informed Sweetener Choices” and “Promoting Food Transparency.”
9. **BRAZIL BUSINESS COMMUNITY:** Finds the Stevia supporter’s emphasis on diversity and the Healthy Living Enthusiast’s focus on transparency most useful, while considering the Sucralose lover’s stance as somewhat dismissive of health concerns and the Sweetener Decider’s approach as overly profit-driven
10. **STUDENT REACTIONS:** Described the question and answers as a crucial step towards enhancing the dialogue between consumers and the food industry. One student reflected, “It is important for manufacturers to listen to different perspectives on sweeteners to make informed decisions that benefit both consumers and the industry.” Another student added, “The emphasis on balance and transparency in the answers shows a commitment to meeting consumer needs while promoting health.”
11. **FOOD POLICY OUTCOME:** May lead to increased efforts by the food industry in Brazil to research and develop a wider range of sweetener options that cater to varying consumer preferences and health considerations. This could also influence future food policy decisions on ingredient labeling and consumer education regarding sweeteners.

Table 5D: Answers to the question regarding the relevant considerations involved when selecting sweeteners for foods.

QUESTION E: WHAT IMPACT DO YOU BELIEVE THE USE OF SWEETENERS WILL HAVE ON THE FUTURE OF FOOD PRODUCTION IN BRAZIL?

1. **WHO ASKED:** The question is asked by a representative of a leading food manufacturer in Brazil with over 20 years of experience in the industry.
2. **WHY ASKED:** The person is asking this question to gain insight into consumer preferences and attitudes towards sweeteners, in order to make informed decisions about product development.
3. **STEVIA SUPPORTER THINKS:** Natural sweeteners like Stevia are the healthiest option for consumers, but publicly states that Stevia should be more widely used in food products to promote healthier choices
4. **SUCRALOSE LOVER THINKS:** Artificial sweeteners like Sucralose are the most effective option for enhancing the taste of food products, but publicly advocates for a balanced approach to sweetener use in food production
5. **SWEETENER DECIDER THINKS:** Weighs the pros and cons of different sweetener options before making a decision, but publicly emphasizes the importance of consumer choice and transparency in labeling
6. **HEALTHY LIVING ENTHUSIAST THINKS:** Prioritizes organic and natural ingredients in food products, but publicly acknowledges the role of sweeteners in moderating sugar intake and promoting healthier eating habits
7. **BRAZIL BUSINESS PRESS:** The food industry in Brazil is actively engaging with consumer preferences regarding sweeteners, with the business press using slogans like “Sweetening the Dialogue” and “Balancing Taste and Health.”
8. **BRAZIL INSTITUTE OF FOODS:** Growing interest in researching the impact of sweeteners on public health, with slogans like “Decoding Sweetness” and “Nutrition Beyond Sugar”
9. **BRAZIL BUSINESS COMMUNITY:** Generally satisfied with the answers, finding the perspectives of the Stevia Supporter, Sucralose Lover, Sweetener Decider, and Healthy Living Enthusiast to be informative and relevant to their industry needs
10. **STUDENT REACTIONS:** Described the question and answers interchange as a “crucial insight into the ongoing debate on sweeteners in food products”, with one student stating, “It is inspiring to see the food industry and consumers coming together to address important issues like sweetener use.”
11. **FOOD POLICY OUTCOME:** May lead to increased regulation on sweetener use in food products, as well as a greater emphasis on consumer education and choice regarding sweetener alternatives.

Table 5E: Answers to the question regarding the future of food production in Brazil and its connection to sweeteners.

“SHOP-ALONG” WITH EACH MIND-SET

We are going to go shopping. For each mind-set, write a detailed paragraph of at least eight sentences, telling us how the mind-set prepares for shopping, what the mind-set does at the store, how the mind-set shops at the store, and what does the mind-set look at when deciding on something to buy. Use quotes to tell us what is going on inside the shopper’s mind. With the eight sentences for the paragraph devoted to the mind-set, “bring the shopping experience alive,” allowing us to feel we are in the mind-set’s mind, looking through the mind-set’s eyes, listening to the mind-set thinking, hearing what the mind-set is asking and commenting.

The Stevia Supporter: Before heading to the store, the Stevia Supporter checks their pantry to see how much stevia they have left and makes a mental note of what other ingredients they need to buy for their favorite recipes. At the store, they head straight to the natural foods section where the stevia products are located. They carefully read the labels on each product, focusing on the purity of the stevia and any added ingredients. As they make their selection, they think to themselves, “I want to make sure I’m getting the best quality stevia without any artificial additives.” They also consider the price, as they know that some stevia products can be more expensive than others.

The Sucralose Lover: The Sucralose Lover is all about convenience when it comes to shopping for sweeteners. Before going to the store, they quickly check their kitchen cabinets to see if they need to stock up on any sucralose products. At the store, they head straight to the sweetener aisle and grab their go-to sucralose brand without hesitation. As they throw it into their shopping cart, they think to themselves, “I love the taste of sucralose and it is so easy to use in all my recipes.” They also take note of any sales or promotions on sucralose products, as they love to save money on their favorite sweetener.

The Sweetener Decider: The Sweetener Decider takes a more analytical approach to shopping for sweeteners. Before going to the store, they do some research online to compare different sweetener options and read reviews from other consumers. At the store, they carefully browse the sweetener aisle, picking up different products to read the labels and compare ingredients. As they weigh their options, they think to themselves, “I want to make the healthiest choice for me and my family, so I need to consider the nutritional value and any potential side effects of each sweetener.” They also consider the versatility of each sweetener, opting for one that can be used in a variety of recipes.

The Healthy Living Enthusiast: The Healthy Living Enthusiast approaches shopping for sweeteners with a focus on overall wellness. Before heading to the store, they check their meal plans for the week and think about how they can incorporate natural sweeteners into their recipes. At the store, they head to the organic produce section to look for fruits like dates or bananas that can be used as natural sweeteners. As they select their items, they think to themselves, “I want to fuel my body with the best ingredients possible, so I’m looking for natural sweeteners that are nutrient-dense and free of any artificial chemicals.” They also consider the environmental impact of their choices, opting for sustainably sourced sweeteners when possible.

Table 6: Result from a “shop-along” with the four sweetener mind-sets.

A “Shop-Along” with the Four Sweetener Mind-Sets

A shopping trip with the four sweetener mind-sets in Brazil would involve exploring the different preferences and beliefs surrounding sweeteners in the country. By simulating this shopping trip with generative AI, we can gain insights into how each mind-set approaches shopping, the products they are drawn to, and the factors that influence their decision-making process. We see this shop-along in table 6. Once again, the depth of information provided by generative AI can be stunning. Equally stunning is the effect on our understanding of these mind-sets when the AI provides simulated or synthesized thoughts in the form of quotes, something that we often see in novels, and may receive in the form of reports from qualitative interviews. The advent of generative AI may provide an opportunity to expand this richness of information and communication.

Discussion and Conclusion

Investigating a subject using simulated AI prior to carrying out a real-world experiment can generate valuable insights and streamline the research process. Through the use of generative AI, researchers can efficiently evaluate the potential outcomes of different variables, enabling them to make well-informed decisions regarding the direction of their research. This approach offers a more comprehensive examination of the subject matter and can reveal fresh insights which may have otherwise been overlooked. Incorporating AI into simulations can provide valuable insights into patterns and trends, which can then be used to shape future research directions and experimental designs.

It is crucial to validate our research empirically to confirm the accuracy of our findings and ensure the reliability of our results. This step allows us to compare and verify the outcomes of our simulations. Simulations offer valuable insights and can generate hypotheses. However, it is crucial to validate the accuracy and reliability of these hypotheses by testing them in real-world settings. Through the integration of simulation insights and empirical validation, researchers can enhance their understanding of the topic and draw stronger

conclusions. Simulations can serve as a valuable tool for hypothesis generation and exploratory research. However, it is important to follow them up with empirical studies to validate their findings.

There is great value in delving into a subject using simulated AI. It gives researchers a platform to generate hypotheses and explore ideas. Simulations are a valuable tool for exploring connections between variables, generating research inquiries, and evaluating the practicality of various experimental approaches. Through AI, researchers can simulate various scenarios to gain a deeper understanding of the intricate interactions within a system. This enables them to make well-informed decisions regarding the direction of their research. Incorporating simulations into the research process can be incredibly beneficial. Not only do they provide a way to anticipate and address potential challenges, but they also allow researchers to plan ahead and prevent any issues from derailing their progress.

Incorporating AI into simulations can prove to be a valuable asset for researchers, offering a platform to generate ideas, test hypotheses, and conduct exploratory research. Simulations have the potential to enhance traditional research methods by providing new insights into complex systems, although they may not completely replace empirical validation. They offer a unique opportunity to gain a deeper understanding of these systems. By blending academic rigor with a relaxed approach, researchers can gain a deeper understanding of the topic and make smarter decisions about their research direction. In this way, the use of AI in simulations can be a major contribution to science, offering a new companion approach to empirical research that can help to advance our knowledge and understanding of the world around us.

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