

The Future of Artificial Intelligence in Potato Promotion/ Education

The State of AI for Potato Farming

A Changing Landscape

- Rapid advancements in technology
- Transforming business, communications, government, more.
- Artificial Intelligence (AI) offers innovative solutions.

Significance of AI in Potato Farming

- Demands for sustainable farming practices and increased productivity can be met more easily with AI tools.

Exploring the Future

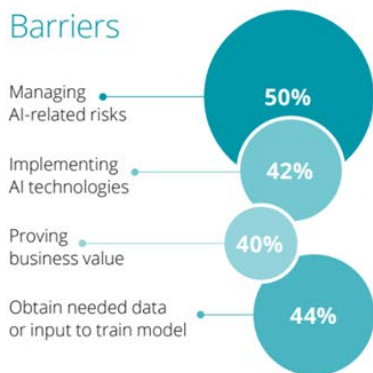
- Focus on promotion and education by augmenting human intelligence and capability with Artificial Intelligence.

A majority of AI initiatives fail. Why?

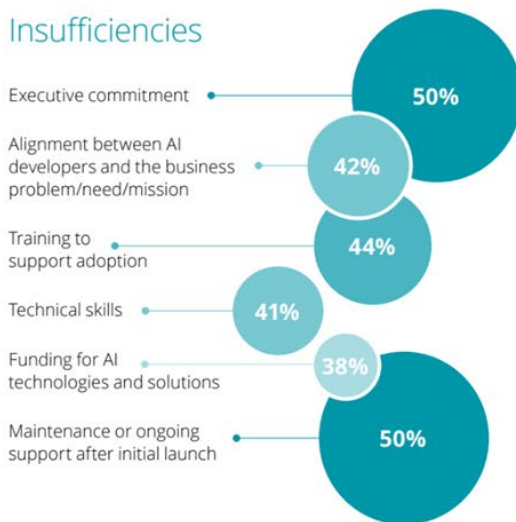
Challenges in scaling AI initiatives

N=2,620 respondents

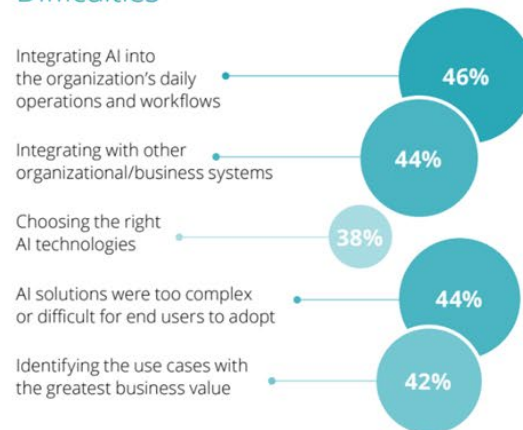
Barriers



Insufficiencies

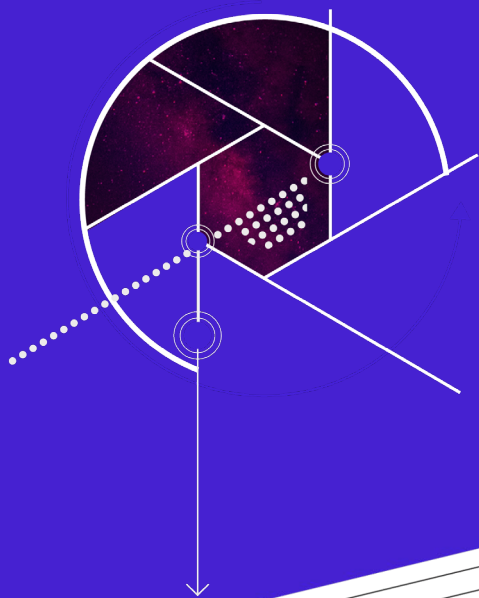


Difficulties





AI Strategy: The 'North Star'



Vision (Future State)

- Identify the need, clearly.
- What will your organization look like in 3-5 years when AI has deeply rewritten the agriculture industry?

Readiness (Current State)

- Self-assessment of state of readiness and willingness to complete the integration.

Roadmap (Transformation)

- Articulating the capabilities you need to develop as an organization in order to transition from current state to future state.
- An intentional sequencing of activities, investments, and strategies necessary to acquire and sustain these capabilities.

Why do this?

Consistency is key. Studies have been conducted on why consistent digital sentiment can have a positive impact. We want AI to handle our reactive marketing efforts so that we can focus on the proactive ones.

Some Data Points

1

Negative Media Sentiment about the Pig Epidemic and Pork Price Fluctuations: A Study on Spatial Spillover Effect and Mechanism

“The mechanism study finds that the negative media sentiment about the pig epidemic positively affects pork price fluctuations through the path of “consumer sentiment”. Therefore, this research recommends that the government department should strengthen the supervision of media sentiment about the pig epidemic and reasonably guide consumer sentiment to stabilize the pork market.”

Agriculture 2023, 13(3), 658, <https://doi.org/10.3390/agriculture13030658>, Published: 11 March 2023.

2

How can perceived consistency in marketing communications influence customer-brand relationship outcomes?

“Results reveal that communication consistency has a strong direct impact on brand trust and brand loyalty...” “...The study contributes to our understanding of the role of IMC in the relationship marketing paradigm and provides deeper insights into the impact of communication consistency on different relationship outcomes with fast -food brands.”

European Management Journal, Volume 38, Issue 2, 2020, Pages 3343, ISSN 0263-2373,
<https://doi.org/10.1016/j.emj.2019.08.011>



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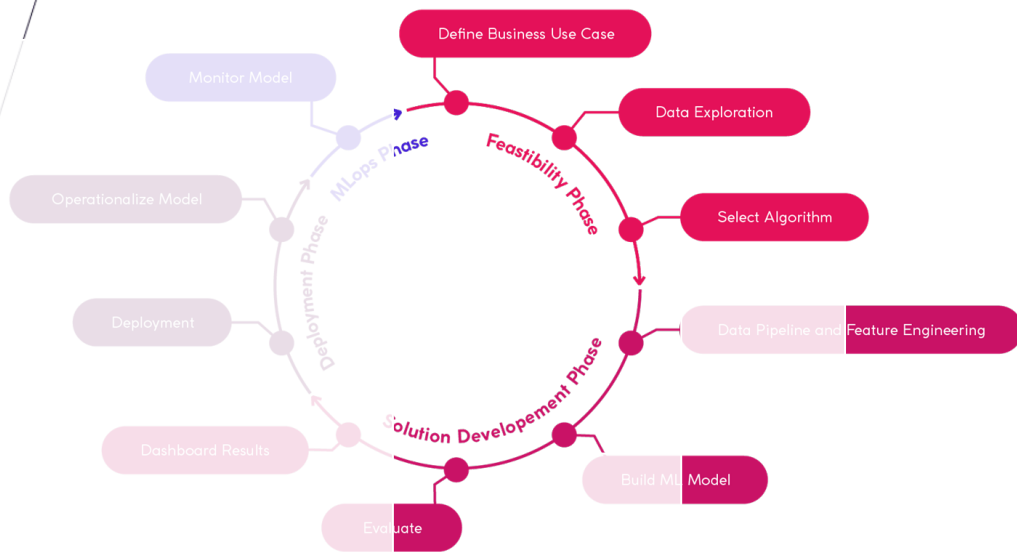


Potatoes USA partnered with KUNGFU.AI, a management consulting and engineering firm focused exclusively on AI, to deliver our strategic AI initiative. This proof-of-concept has the potential to redefine how we perceive and promote potatoes. It enables us to craft informed responses that disseminate positive, factual information while mitigating the impact of misleading claims on a large scale.

Overview

Prove: Use a generative AI solution to help augment marketing and nutritional operations by identifying social sentiment and write responses to them with.

Objective: Help make positive, factual information accessible, and mitigate misleading claims by generating and optimizing content in response to negative online potato-related narratives at scale.



KUNGFU.AI's Model Accelerator Program

The Model Accelerator kicks off the AI lifecycle that quickly exploits the problem with a viable solution and begins to establish the technical foundation for our full scale development.

What we did: Model Pipeline

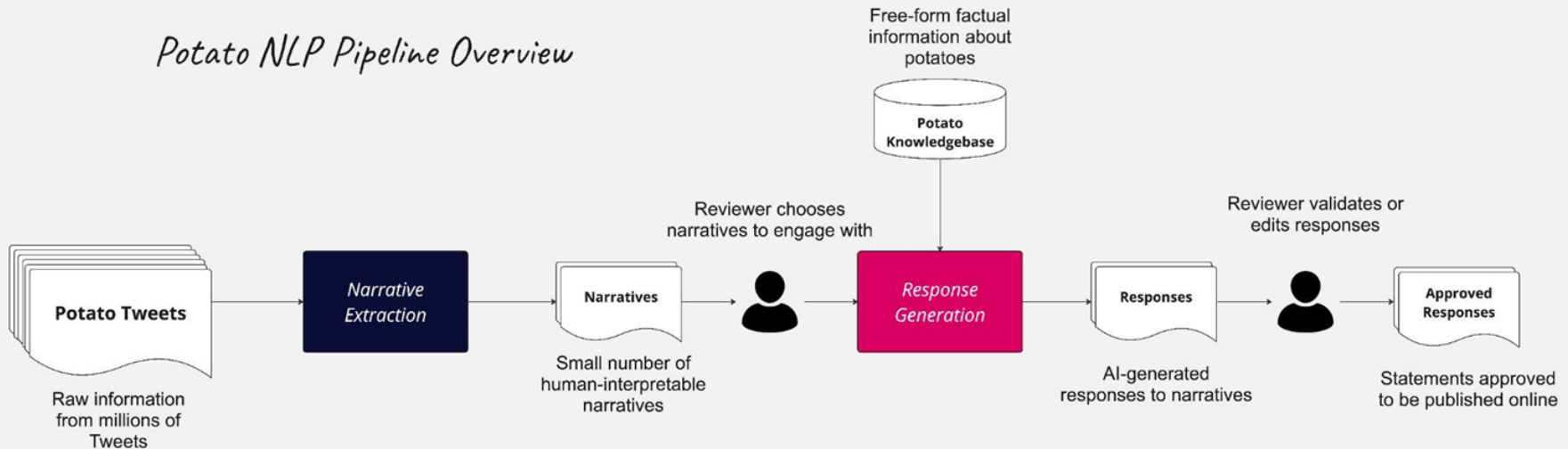
Narrative Extraction

Identifies key Twitter narratives propagating potato-related misinformation. Extracted from millions of tweets per day.

Response Generation

Using state-of-the-art AI techniques, the model generates friendly, fact-based responses to the key narratives based on the supplied research data.

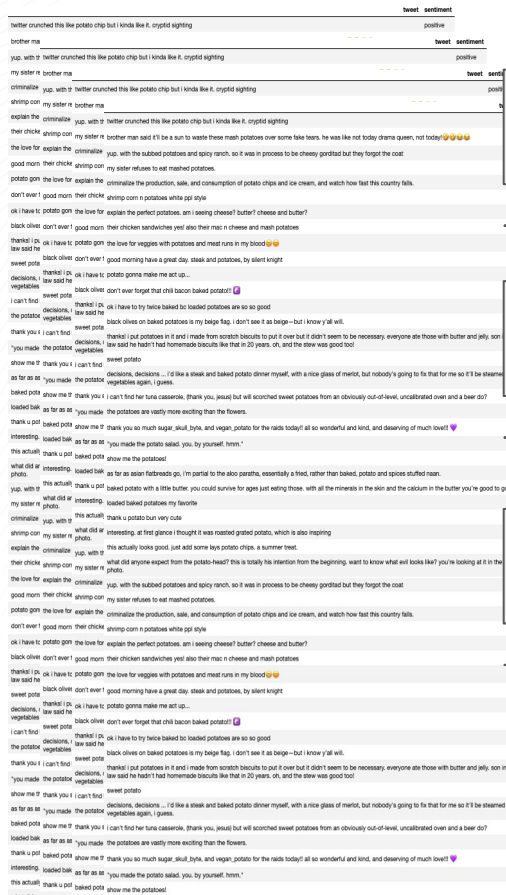
Potato NLP Pipeline Overview



NOTE: Includes 1200 lines of source code and was not possible 6 months ago.

Narrative Extraction

There are thousands of potato-related tweets per day



Positive, not important

The love for veggies with potatoes and meat runs in my blood

Negative, important

avoid potato eat carrot irreplaceable elvish yadav

Neutral, not important

did you say potato fields?

Positive, important

potatoes are rich in iron / folate



Finding Narratives

tweet

potatoes are bad carbs #unhealthypotato

HIGH glycemic index for potatoes, steer clear!

High glycemic index in potatoes! <https://article.com>

High in acrylamide, be careful it can cause cancer

potatoes are bad carbs

potatoes not regular potatoes, they are healthier

Choose wisely for a healthier option. #HealthyChoices

Be informed about your food choices. #FoodSafety

... A tasty swap for a healthier you! #NutritionTips

... for insights: <https://articlelink.com> #HealthAlert

... potatoes. Your health matters! #WellnessWednesday

... eat potatoes for a healthier plate. #HealthyLiving

... for glycemic index, better choices. #HealthyLiving

... take to reduce potential risks. #FoodAwareness

... Choose wisely for a healthier lifestyle. #NutritionFacts

... healthier you. <https://articlelink.com> #HealthAlert

... eat potatoes for a guilt-free plate. #SmartEating

... for a healthier lifestyle. #WellnessWednesday

narrative

['carbs', 'high',
'bad', ...]

['glycemic',
'index', ...]

⋮

['acrylamide',
'cancer', ...]

Define what narratives are important

Working definition:

Important = at least one keyword and tweet in the narrative are related to discussion of health, nutrition, diet, or recipes
keywords tweets

27

['potassium', 'sugar',
'blood', 'also',
'carotene', 'type',
'corn', 'sweet']

["yes but only when people have 4 or 5 of these in a day or together in a meal. independently u can't call potato or banana or pizza or pasta or rice or anything else unhealthy. have one of the listed items in a meal and it's healthy.", 'it's more like calories rather than nutrition. what is it? wheat, corn, potatoes, rice, soy beans? i can't remember the other one. corn and soy get converted largely into animal feed.', '"add potato, barley, palm oil, soy and sugar to the mix, and you have 75% of all the calories. but diversity within these crops is also disappearing, as we rely on an ever-smaller number of high-yielding varieties." human healthy eating needs lots of seasonal variety too', "i think so. my blood sugar spikes with just one banana, let alone 5 potatoes. i don't eat enough potassium but my levels are fine in blood tests, so something is off with these rdas.", 'yes i do,i read that at sokoine university of agriculture (2020).course:as 201:applied animal nutrition,semester 04. and to be sure carotene is also found in other fruits(sweet potato and mango etc. specifically beta-carotene. in add;excess carotene is converted into vitamin a']

13

['low', 'carb', 'rice',
'nuts', 'fruit', 'fat',
'weight', 'diet', 'eat',
'day']

['since i have ibs - keto, if, and low carb are not feasible. since i love sweet foods like potatoes, fruit, pasta, and rice, a lower-fat, higher carb diet works best for me. win-win.', 'dont neglect any macro but eat the best filling sources: - carbs: fruit n veg, potatoes/sweet potatoes, rice cakes, oats, weetabix, legumes.. - protein: low fat yog/cheese, chicken/turkey, eggwhites, tuna.. - fats: avo, eggs, nuts, salmon, beef..', 're: glycemic control (choose this over that) oatmeal & fruit > bagel or doughnut brown rice or farro or barley > white rice beans or cauliflower rice > starchy white potatoes > high fiber (oats, nuts, beans, apples, citrus fruit) will reduce absorption of sugar by the gut', 'carbohydrates. try having just 1 carb a day. for example if you have potatoes or chips for your dinner don't have bread for your lunch. there's no point in buying low fat foods because they're full of sugar and have the same if not more calories. also try having less sugar.', "here's what else i could add: - avocado or nuts/nut butters a couple times a week to increase the fat content - 1-2x protein shakes per day - 20g dark chocolate every day - 1-2x servings of fruit everyday - pasta once a week. - swap potatoes or rice out for a breadly carb source"]

Define what narratives are not important

Working definition:

Not important = other passing mentions of potato, short references to potatoes as food, use of potato for other purposes than discussion of food
keywords tweets

['raw', 'potatoes',
'hash', 'eat', 'salt',
'browns']

['how do you even eat a raw potato?', 'this guy is eating a raw plantain & saying it tastes like a starchy banana. the qt is calling cap saying more like eating a raw potato. maybe i am sus if u r talking abt boiled plantains i guess. but raw? outta here, how that not like eating a potato?', 'can i eat a raw potato?', 'this is the first time in my 27 years of life i've seen someone take a bite out of a raw plantain. that's crazy to me. it's kinda like a potato it's prepared cut up & either boiled, mashed or fried in thin slices lmao. imagine someone biting into a raw potato fresh out the earth.', 'eat a potato raw']

['cat', 'finished',
'vehicle', 'clock',
'potato', 'hair', 'team',
'orange', 'thing', 'haha']

['i really like how potato the cat sounds...almost like thecat could be the surname (and whoa... kitted out!)', "and before anyone comments about the orange cats thing... i got one, and he's the absolute dumbest potato compared to my other, not-orange cat. 🤪", 'this cat is 100% potato', 'according to king's u. communication team, classroom mask mandate will remain in place. this team would most likely also agree that a potato stuffed into a vehicle's tail pipe will enhance vehicle performance with no consequences.', 'our cat. a potato. oh right, one thing.']

Model trained to predict importance

	keywords	tweets	importance
0	['potassium', 'sugar', 'blood', 'also', 'carot...	["yes but only when people have 4 or 5 of the...	important
1	['low', 'carb', 'rice', 'nuts', 'fruit', 'fat'...	['since i have ibs - keto, if, and low carb ar...	important
2	['raw', 'potatoes', 'hash', 'eat', 'salt', 'br...	['how do you even eat a raw potato?', 'this gu...	not important
3	['cat', 'finished', 'vehicle', 'clock', 'potat...	['i really like how potato the cat sounds...al...	not important
4	['shake', 'tahir', 'tons', 'potahto', 'talking...	["it's called chii chans spiral special potato...	not important
5	['wariornun', 'savewariornun', 'drew', 'nuns...	['potato, potato, 🍟 drew help our nuns savewar...	not important
6	['cal', 'taco', 'total', 'cals', 'kcal', 'amp'...	['day 16: ☆chocolate cereal bar (82 cals) ☆che...	not important
7	['joe', 'potato', 'knew']	['damn, you got it right for once. joe the pot...	not important
8	['baked', 'potato', 'triple', 'bake', 'loaded'...	['with a baked potato or like a baked potato? ...	not important
9	['brandon', 'looks', 'like', 'body', 'man', 'f...	['brandon... please see the continued dialogue h...	not important
10	['potato', 'god', 'im', 'hello']	["you're a potato", 'if u are a teacher you th...	not important
11	['pc', 'games', 'game', 'play', 'run', 'consol...	['let's go i need this pc i only have potato p...	not important
12	['tomato', 'insult', 'potato', 'friendly', 'po...	['that's an insult to potatoes!', "i saw how y...	not important
13	['chips', 'chip', 'potato', 'crisps', 'lays', ...	['baked potato chips', 'can i have potato chip...	not important

Response Generation

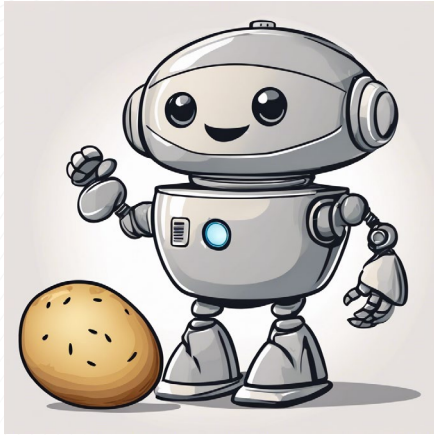
Case Study 1a - Keto and Carbs Narrative

Keywords: (carbs, keto, diet, pasta, lost, weight, sugars, ago, bread, rice)

Top Tweets:

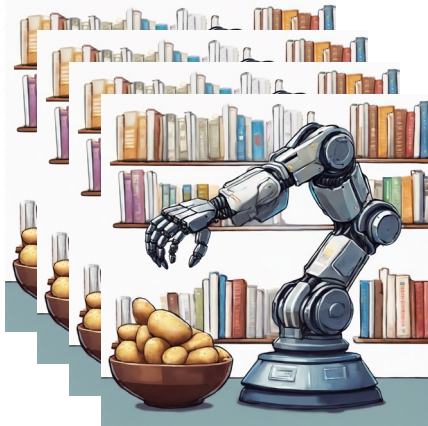
- all things in moderation and for me no bread, rice, pasta, sugar, potatoes, or flour, and i've lost 20 lbs and 2 pants sizes, and i can see my feet when i'm standing. i do keto and intermittent fasting, and i can eat steak and hamburgers in moderation and cheese. i love my...
- interesting, so were you basically on the keto diet? don't you still need carbs for energy? did you replace the bread with anything else like potatoes? or just meat and veggies and fruit?
- i began a low-carb diet 3 weeks ago have already dropped 10 pounds. i will eat carbs, but only actual vegetables (potatoes, yams, etc) made at home. the weight just drops right off.
- i quit carbs about 8 months ago. no bread, pasta, white potato and most refined sugars. i've lost 30 pounds, 4 pants sizes. eating most meats and vegetables. intermittent fasting helps also. no food after 6-7pm and first meal of the next day at 1 pm. i'm 69 and feel great!
- i stopped about 2 months ago with no bread, no potatoes, and no white rice or pasta. i've lost 20 pounds and two pants sizes, plus i have more energy and it's not hard after a while.

Response Generator - Meet the AI



Spuddie - A friendly AI assistant for all your potato queries. We've instructed him using a combination of code and natural language.

He takes in a narrative and uses his tools to construct a response to get you started.

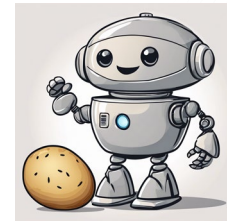


Research Arm- A tool used by Spuddie to gather information from a knowledge base. Spuddie asks a question, the Research Arm finds the relevant information.

Prompting

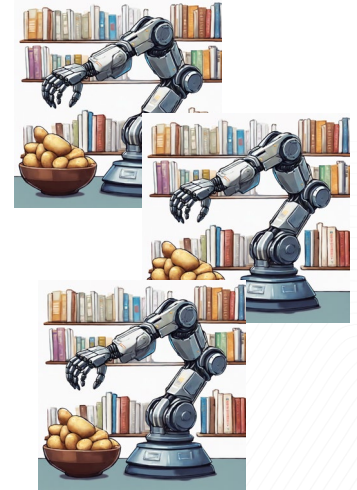
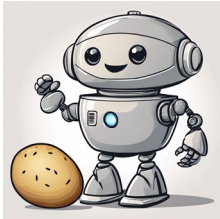
- Your goal is to educate the public about potatoes, especially their nutritional value and health benefits.
- Here is a **narrative** circulated on Twitter.
- Here are your knowledge bases of **potato research**, and **example responses**

Please construct a response that kindly and appropriately clarifies any misinformation.

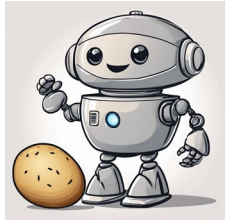


Behind the Scenes

What do I need to know to respond appropriately?



Behind the Scenes



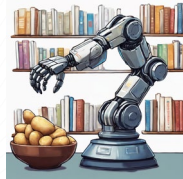
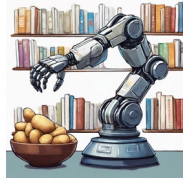
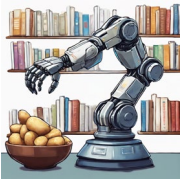
What are the nutritional benefits of potatoes?



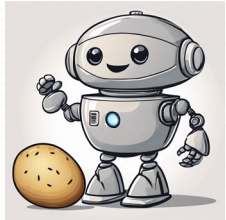
Can potatoes help with weight loss?



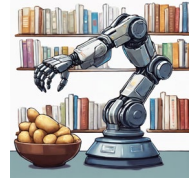
What are some healthy alternatives to pasta and rice?



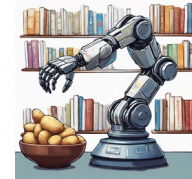
Behind the Scenes



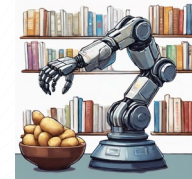
Potatoes are a nutritionally balanced food that is high in vitamin C, antioxidants, and other key vitamins and nutrients. They are a significant source of vitamin C, providing about 25% of the.....



Yes, potatoes can help with weight loss. The protease inhibitor in potatoes promotes the release of cholecystokinin, which makes you feel full, and people lose weight when they eat this substance. Proteins in potatoes can also indirectly inhibit absorption.....

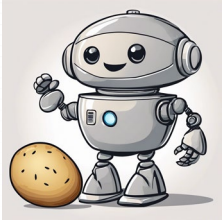


Cooked potatoes, especially with their skin on, can be a healthy alternative to pasta and rice. They contain more fiber.....



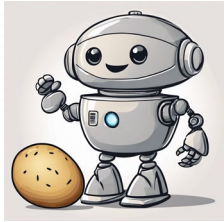
Spuddie's Response (What You See)

Potatoes are a versatile and nutritious food that can be a part of a healthy diet. While it's true that potatoes contain carbohydrates, it's important to remember that not all carbs are created equal. Potatoes are a good source of complex carbohydrates, which provide sustained energy and are an important part of a balanced diet. In fact, potatoes have a lower caloric density compared to other common side dishes like pasta and rice. Additionally, potatoes are rich in vitamins and minerals, such as vitamin C and potassium. So, if you're looking to include a nutritious and satisfying food in your diet, potatoes can be a great choice.



Spuddie's Response (What You See)

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Content Wins

- Mentions nutrients in potatoes
- Brings nuance about carb types
- Healthier alternative to pasta and rice!

Style Wins

- Pleasant, helpful tone
- Efficient: lots of info in few words
- Genuinely leverages knowledgebase to inform factuality of response

Case Study 1b: Nightshades are Poison Narrative

Keywords: (poisonous, nightshade, family, poison, knowing, green, two, ones, plant)

Top Tweets:

- *babe potatoes are in the nightshade family that's literally poisonous unless you cook em and...*
- *but not all of them are bad. yeah and if you bought a box of potatoes with 1/100 being poisonous would you take the whole box and eat them knowing that people have told you one is poisonous or would you refuse it to save you and the other people who may eat it?*
- *yeah, so, potatoes are in the nightshade family and every part of the plant other than the tubers is poisonous. if they're exposed to light, they start turning green and making the same poisonous compounds that are in the rest of the plant. most of them are in the skin.*

Challenge: This is *roughly* true, but an excessively negative framing

Case Study 1b - Response

It's great to see so much interest in potatoes! I wanted to clarify some misconceptions that have been circulating. Firstly, potatoes are not poisonous. However, green patches on the skin indicate the presence of a chemical called solanine, which can cause illness if consumed in large quantities. To prevent this, potatoes should be stored in a cool, dark place, and any green skin should be cut away before cooking and eating.

Secondly, while potatoes belong to the nightshade family, this does not make them inherently harmful. Many common vegetables, such as tomatoes and peppers, also belong to this family.

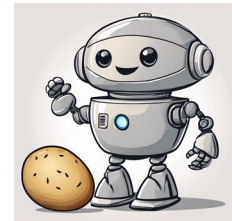
I hope this information helps to clear up any confusion. If you have any more questions about potatoes, feel free to ask!

Content

- Separates fact from falsehood
- Adds relevant context (other veggies)

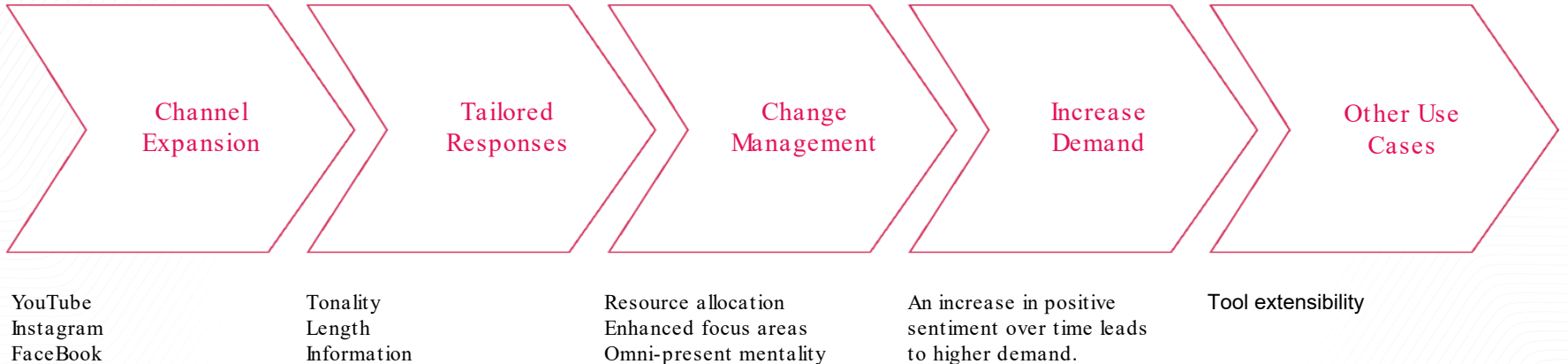
Style

- Polite, non-confrontational
- Highly enthusiastic



How do we plan to use this?

Improve marketing operations at scale





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