



THE GREEN GUIDE: RECOMMENDER SYSTEM

Team Wellington

Arnav Hasija
Ekram Diab
Hema Sridhar
Jerry Tang
Joanne Evangelista
Swaroop Ampolu
Tarun Mahajan

TABLE OF CONTENTS



01

PROBLEM

How to reduce humans' level of meat consumption?



02

DECISION PROCESS

Identify target market and develop prototype.



03

COMMERCIALIZATION

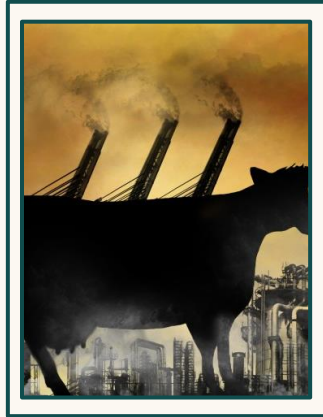
Launch rollout plan and assess outcome metrics.

PROBLEM

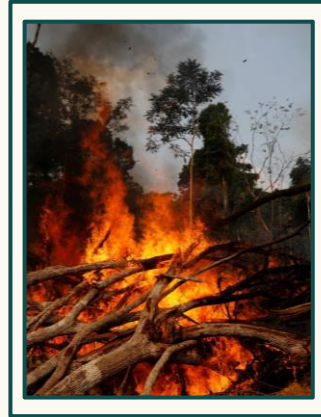
At the rate humans are going, the current level of meat consumption is unsustainable.



If fishing trends continue, oceans could be empty by **2048**.



Food production process is responsible for **35%** of global emissions.



Deforestation could turn the Amazon rainforest into a desert in **30-50** years.

CURRENT SOLUTIONS ARE NOT ENOUGH DUE TO:

- **Conflicts of interest** between stakeholders
- Reactions to decades of **over consumption**
- Lack of effective **regulation**
- Old-fashioned **greed**

What can we do?

The only way to rebound from the damage that humanity has caused is to **significantly reduce or eliminate** our meat intake.

IN-DEPTH INTERVIEWS

Through conducting interviews with representatives across the meat consumption spectrum, we identified **four key challenges** to solving our problem.



Nutritional Value

"Meat is the best source of protein to achieve my fitness goals."

ANNA



Lack of Options

"I don't want to eat chickpeas and peanut butter every single day."

JORDAN



Cost

"Eating more plant-based products are more expensive than meat."

JULIAN



Education

"People disassociate where the food they eat comes from."

LAUREN

OUR DESIGN THINKING APPROACH

Goals

Empathize

Insight into the problem

Define

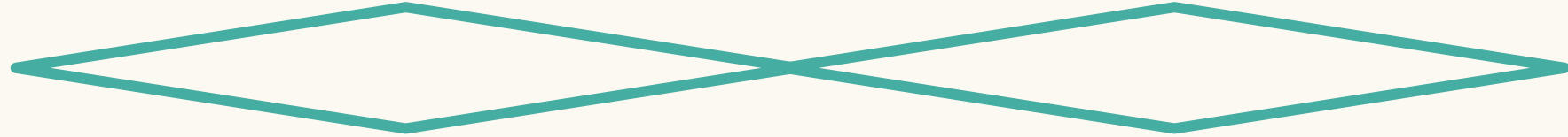
The area to focus on

Ideate

Potential idea

Deliver

A plan forward



Insights

- Meat production has a high impact to the environment
- Consumers find difficulty to reduce consumption due to lack of alternatives



- **HOW MIGHT WE** convert the consumption behavior into a sustainable, healthy, and environmentally friendly?



- Digital recommender system that provides equivalent healthy meat substitutes, and environmentally friendly



- Expand functionalities, partnerships, and competitive advantage

Activities

Research, trends, and interviews

Identify target users, technologies, and market opportunities

Prototype a solution, and define MVP

Technology enhancements, and market expansion

Prototype

The Green Guide

The Green Guide - Recommender System

tina

Product

Tuna

Chicken breast

Closest Match By

Carbohydrate

Fiber

Macro Nutrients

Protein

Vegan Only

Show Infant Food

Nutritional Values of Chicken breast

Category	Description	Carbohydrate	Cholesterol	Fiber	Protein	Sugar	Water	Fat	Vitamin B12
Chicken breast	Chicken breast, grilled with sauce, skin not eaten	7.34	78.00	0.20	24.33	5.98	61.16	4.93	0.15

Recommended Alternatives for Chicken breast

Main Ingredient

Any Rice Soy Cheese Bread Beans Milk Yogurt

Category	Description	Carbohydrate	Cholesterol	Fiber	Protein	Sugar	Water	Fat	Vitamin B12
Natto	Natto	12.68	0.00	5.40	19.40	4.89	55.02	11.00	0.00
Cheese ball	Cheese ball	5.57	71.00	1.50	18.09	1.74	35.32	38.06	0.66
Grilled cheese sandwich	Grilled cheese sandwich, reduced fat Cheddar cheese, on whole wheat bread	24.50	43.00	2.80	15.87	2.79	37.88	18.46	0.50

Prototype link:

<https://apex.oracle.com/pls/apex/hema1126/r/green-guide/home-2>

SOLUTION: THE GREEN GUIDE

Search

Search products

chicken

Nutritional values

protein	Fat	Carbs	water
0.19g	0.05g	0.10g	0.08g

Environmental impact

CO2 emission /g 2%

Water consumption /g 3 gallons

Recommended green alternatives

tomato

protein	Fat	Carbs	water
0.16g	0.02g	0.10g	0.22 g

Estimated Saving

CO2 saving 2% Water saving 1gallon

banana

avocado

Home Search Favorites

Recipes

Explore protein and iron substitutes

Meat substitutes

Seafood substitutes

Vegetables

Grain

Noodles & Pasta

Fruit

Explore meals

Breakfast

Lunch

Dinner

Appetizers

Dessert

Sides

Home Search Favorites

Caesar salad

Total time 30 min Calories 419

Serving 4 people Calories 312

Classic Caesar Salad with crisp homemade croutons and a light caesar salad dressing.

Caesar salad is easy, classic and the ingredients are simple.

Ingredients

+

+

+ Greenhouse impact

Environmentally Friendly

+ Recommended

+ Recommended

OVERVIEW OF DATA JOURNEY



1. Source the Data

- Over 7,000 products
- 2,425 categories
- 35 nutritional features



3. Feature Selection

- Based on in-depth interviews
- Focus on macronutrients



2. Clean the Data

- Remove meat products
- Reduced to 4,460 products



4. Recommender System

- Identify products which provide a similar level of nutritional value

OUR EVOLUTION ROADMAP



Prototype

Proof of Concept

- Search functionality with alternative meat substitutes based on nutrition similarity score

MVP Launch

Support meat reduction approach

- Digital Mobile App
- Recommend products based on: (recipes, grocery, taste)
- estimated environmental impact

Year 2

Purchase conversion

- B2B partnerships with online grocery shopping

Year 3+

Smart Recommender system

- Strong database of plant-based characteristics.
- Partnership with plant-based meat companies to support their R&D

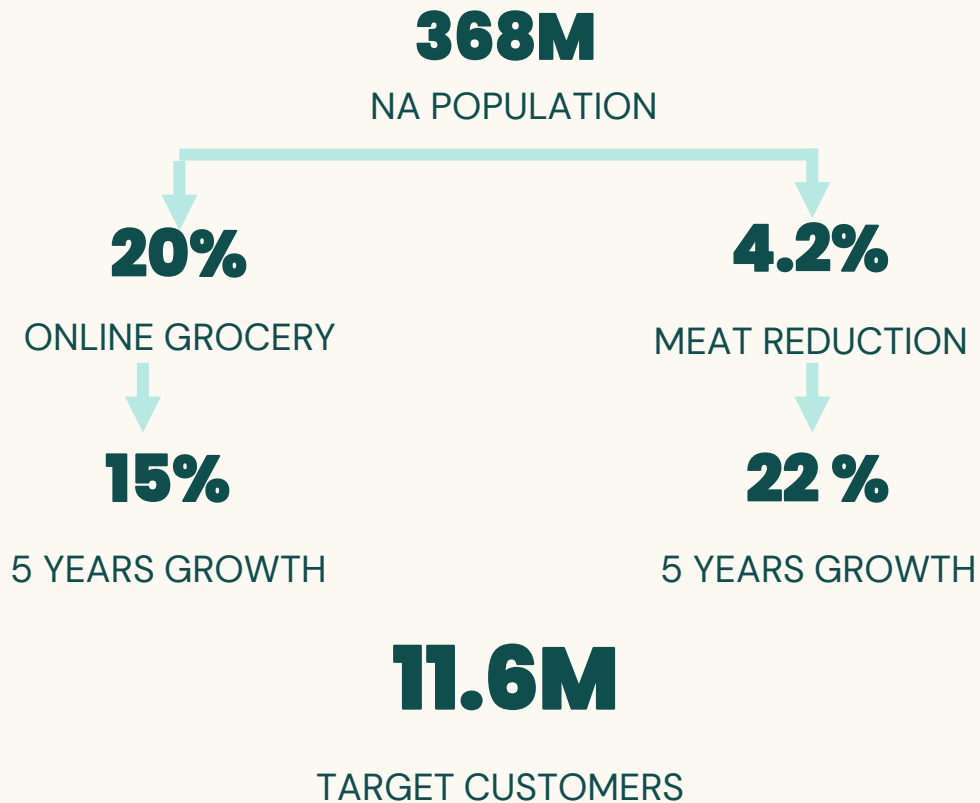
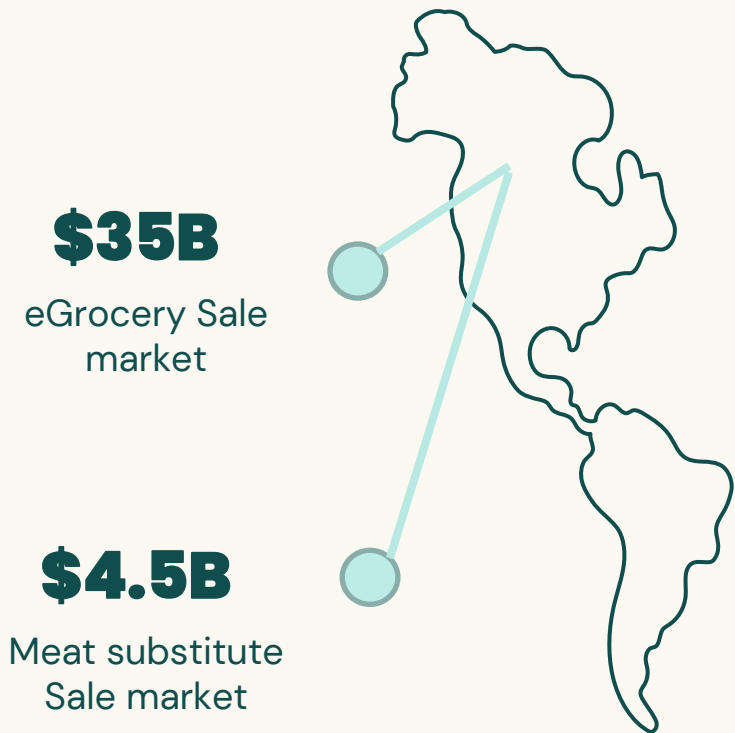
OUTCOME METRICS

- 50% activation rate across target users
- Drive conversion among 45% of the active users
- Triple size of the dataset
- 3 ecommerce partnerships

TARGET CUSTOMERS

- Health conscious
- Vegetarian/Vegan market
- Environment supporters
- Begin B2B partnerships
- Expand to meat lovers
- B2B customers

MARKET OPPORTUNITY



BUDGET & COST



6 months

Timeline



\$60,000

App
Development



\$20,000

Marketing



\$20,000

Maintenance

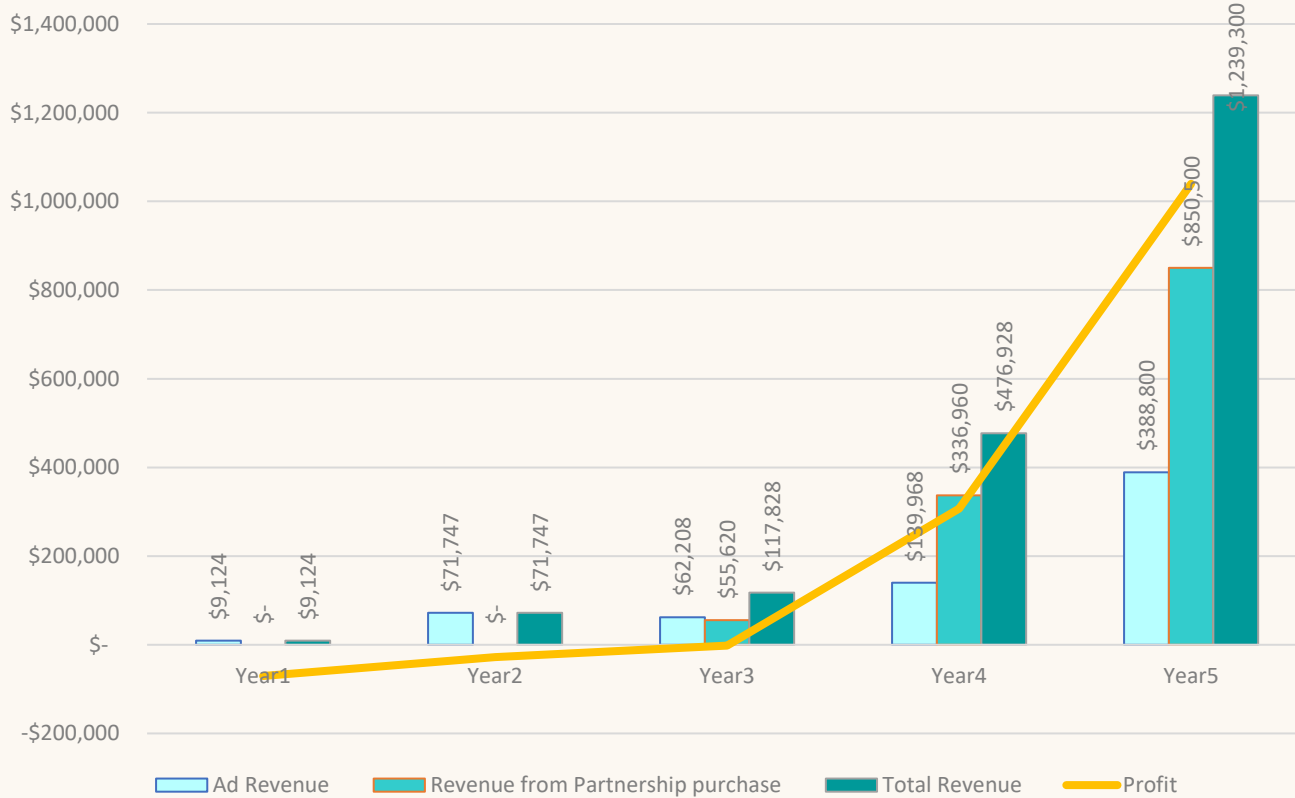


\$100k to
\$200k

R&D
Upgradation

Despite the high initial costs, we **expect to breakeven and eventually profit**

REVENUE & PROFIT - PROJECTION



\$ 1.03M

Projected Profit in
Year 5

RISKS ANALYSIS

Challenge

Description

Mitigation Strategy

ETHICAL

- **Individuals:** consumer preferences shaped by impact to animal welfare, environment, health and fair trade.
- **Businesses:** face ethical choices when deciding the source of products, what to carry, how to run operations
- **Individuals:** provide the knowledge to make an informed choice
- **Businesses:** appeal to partners with similar values and promote sustainability as a differentiating factor

COMMERCIAL

- **Data:** user activity, cost options, nutritional quality and environmental impact for every product
- **Partners:** attract external partners to enhance our user base and help support growth
- **Retention:** foster customer stickiness throughout their lifetime
- **Data:** free offering, promote to target market, invest in R&D
- **Partners:** advanced technology with the data to support our product
- **Retention:** release new features, incentivize through gamification

"Any sustainable food system must have ethics at its heart." – Food Ethics Council

IMPACT AT A GLANCE

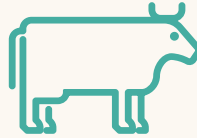
Water

Team Wellington could save **3,724** gallons of water over one month.



Animals

Section 1 can spare **12,870** animals over six months.



CO₂ Emissions

MMA cohort can eliminate emissions equal to driving **42,456** miles over one year.



Financial

Reduce grocery budget by **\$15** each week.



World Hunger

Queens' University could divert **1.1 billion** pounds of grain over their tenure.



SUSTAINABILITY



QUESTIONS?

APPENDIX

SOLUTION CONSIDERATION

Unique Value proposition

Create a sustainable lifestyle by providing healthy recommendations with an environmentally-conscious focus.

Main Challenges

Access to accredited, accurate, and unbiased product data with nutritional values, health considerations, and environmental impact.

APPENDIX – COST CALCULATION

Development Cost		\$
Discovery Stage	\$	10,000
UI/Design Stage	\$	15,000
Development Stage	\$	25,000
Testing and Deployment Stage	\$	10,000
	\$	60,000
Marketing Cost		\$
Initial Marketing	\$	20,000
Total		\$
Total Initial Cost	\$	80,000

	Year 2	Year 3	Year 4	Year 5
Maintenance	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
R&D and Upgradation	\$ 100,000	\$ 130,000	\$ 180,000	\$ 230,000
Total	\$ 120,000	\$ 150,000	\$ 200,000	\$ 250,000

APPENDIX – REVENUE AND PROFIT CALCULATION

	Year1	Year2	Year3	Year4	Year5		
	H1	H2	H1	H2			
Number of Native App Users	1,000	2,000	5,000	7,000	10,000	15,000	25,000
Active users	720	1,440	3,600	5,040	7,200	10,800	18,000
Impressions per minute	2	2	2	2	2	2	2
Total Impressions	7200	14400	36000	50400	72,000	108,000	180,000
Number of Ads per month	5,000	7,500	10,000	15,000	20,000	20,000	20,000
Revenue	\$ 144.00	\$ 288.00	\$ 720.00	\$ 1,008.00	\$ 1,440.00	\$ 2,160.00	\$ 3,600.00
eCPM	28.8	38.4	72	67.2	72	108	180
Total Ad Revenue per month	\$ 207.36	\$ 552.96	\$ 2,592.00	\$ 3,386.88	\$ 5,184.00	\$ 11,664.00	\$ 32,400.00
Total Ad Revenue per year	\$ 2,488.32	\$ 6,635.52	\$ 31,104.00	\$ 40,642.56	\$ 62,208.00	\$ 139,968.00	\$ 388,800.00
Instacart User Base		9,000,000		9,180,000	9,270,000	9,360,000	9,450,000
Potential User Base from Instacart					92,700	374,400	708,750
Potential Partnership Purchases per month					9,270	56,160	141,750
Potential Partnership Purchases per year					111,240	673,920	1,701,000
Revenue from Partnership purchase					\$ 55,620.00	\$ 336,960.00	\$ 850,500.00
Total Revenue	\$ 2,488.32	\$ 6,635.52	\$ 31,104.00	\$ 40,642.56	\$ 117,828.00	\$ 476,928.00	\$ 1,239,300.00
Initial Development and Marketing Cost	\$ 80,000						
Maintenance Cost				\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
R&D and Upgradation Cost				\$ 80,000	\$ 100,000	\$ 150,000	\$ 180,000
Profit	-\$ 70,876.16		-\$ 28,253.44	-\$ 2,172.00	\$ 306,928.00	\$ 1,039,300.00	

Year1-1%
Year2-4%
Year3-7.5%

Year1-10%
Year2-15%
Year3-20%

\$ 0.50
For each purchase

Ad Revenue Calculation Reference:

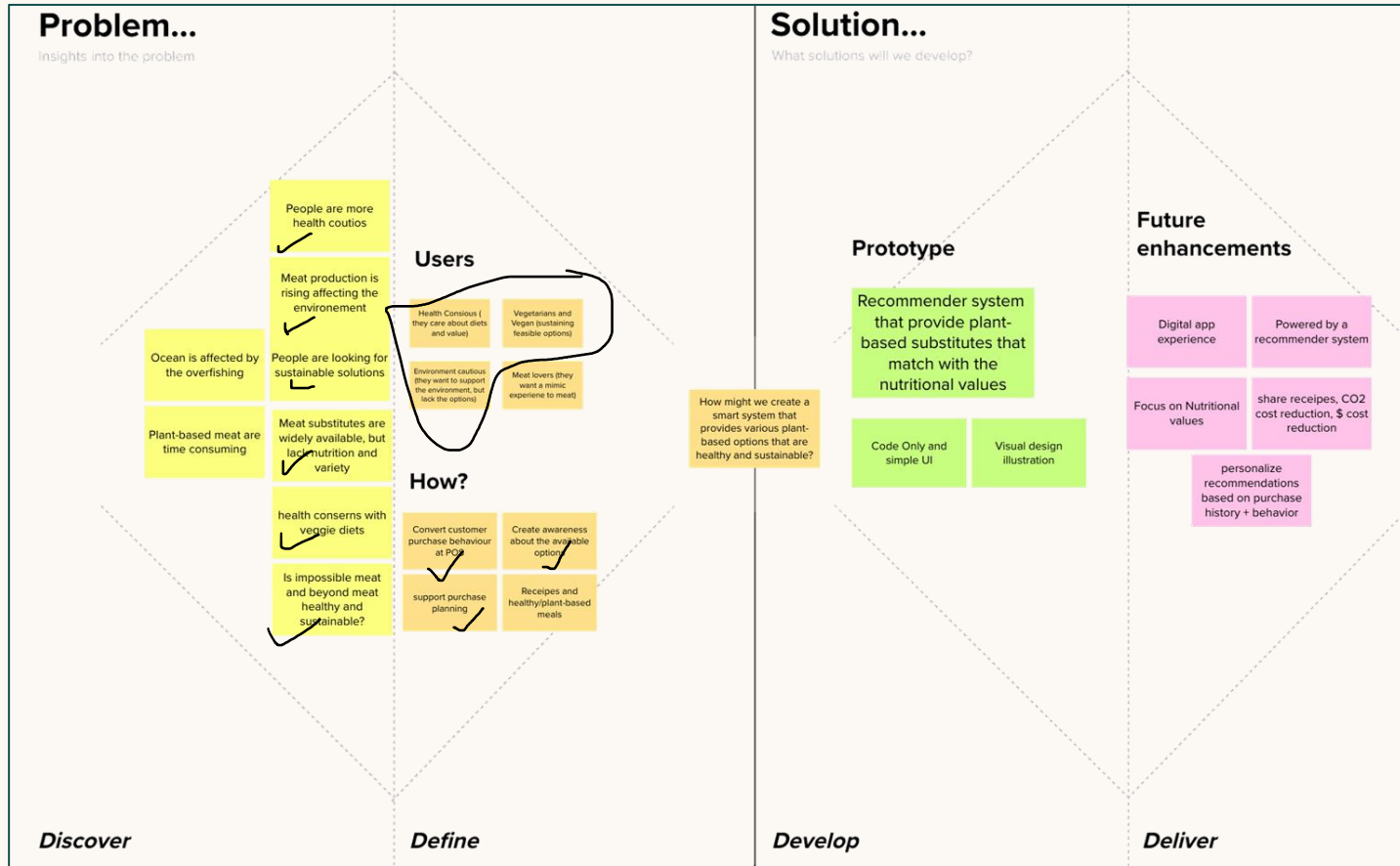
<https://www.linkedin.com/pulse/how-calculate-mobile-advertising-revenue-app-100000-users-minak>

APPENDIX – MARKET OPPORTUNITY CALCULATION

	US		CA	
	Year 1	Year 5	Year 1	Year 5
Total Population of NA	321,200,000		35,800,000	
Vegetarian population	19,632,000	20,613,600.00	2,300,000	2,392,000.00
Potential new customers	2,552,160.00	2,654,246.40	506,000.00	526,240.00
Total potential market for year 1 vs year 5	22,184,160	23,267,846	2,806,000	2,918,240

	NA	
	Year 1	Year 5
Total population in NA	358,869,647	372,558,343
Vegan, vegetarian, and potential market for meat reduction	4.2%	22.0%
Vegan, vegetarian, and potential market for meat reduction	24,990,160	34,988,205
Online Grocery users of the population	20%	33%
Total	4,998,032	11,662,735

How did we come up with the solution (MAP)



Resources

- Abreu, M. (2019, December 16). *How the beef industry is driving the deforestation of the Brazilian Amazon*. Retrieved from GlobalWitness: <https://www.globalwitness.org/en/blog/how-beef-industry-driving-deforestation-brazilian-amazon/>
- Blakley, L. (2020). *How Many Vegans in The World? In the USA? (2020)*. Vegan Bits. Retrieved November 30, 2021, from <https://veganbits.com/vegan-demographics/>
- Classifying Different Types of Recommender Systems*. (2015, November 14). Retrieved from Bluepiit: <https://www.bluepiit.com/blog/classifying-recommender-systems/>
- Conzachi, K. (2021, March 18). *Meatless Mondays: "Less Meat, Less Heat!"*. Retrieved from Colorado: <https://www.colorado.edu/ecenter/2021/03/18/meatless-mondays-less-meat-less-heat>
- CORGIS Dataset Project. (2021, October 15). Retrieved from USDA Agricultural Research Service: <https://corgis-edu.github.io/corgis/csv/food/>
- Food label "fowl" play: the free run myth*. (2021, September 27). Retrieved from SPCA: <https://spca.bc.ca/news/free-run-chicken-myth/>
- FoodEthicsCouncil*. (2020). Retrieved from Understanding Food Ethics: <https://www.foodethicscouncil.org/learn/food-ethics/>
- Geckoboard, T. (2020, December 16). *The A-Z guide to startup metrics: 16 KPIs to help your business succeed*. Geckoboard. Retrieved November 30, 2021, from <https://www.geckoboard.com/blog/the-a-z-guide-to-startup-metrics-16-kpis-to-help-your-business-succeed/>
- Harriman, M. (2017, October 31). *7 reasons to go meatless one day a week (+ a day of meal ideas to get you started)*. Retrieved from Medium.

Resources

- Harvard Business Review. (2015, December 9). *Instacart – The future of grocery delivery is here! But is it sustainable? - Technology and Operations Management*. HBS Digital Initiative. Retrieved November 30, 2021, from <https://digital.hbs.edu/platform-rcotom/submission/instacart-the-future-of-grocery-delivery-is-here-but-is-it-sustainable/>
- Heffernan, K. J. (2017, May 8). Design Thinking 101 — *The Double Diamond Approach (Part II of II)*. Medium. Retrieved November 30, 2021, from <https://medium.com/seek-blog/design-thinking-101-the-double-diamond-approach-ii-4c0ce62f64c7>
- Institute of Design at Stanford. (n.d.). An Introduction to Design Thinking PROCESS GUIDE. <https://web.stanford.edu/~mshanks/MichaelShanks/files/509554.pdf>
- Kahn, J. (2017, July 19). *The Environmental Impacts of Going Vegetarian For Just One Day*. Retrieved from Vegnews: <https://vegnews.com/2017/7/the-environmental-impacts-of-going-vegetarian-for-just-one-day>
- Maheshwari, I. (2019, May 28). *Focus Groups vs. One-on-One Interviews (When and Why)*. Retrieved from Medium: <https://medium.com/uxarmy/focus-groups-vs-one-on-one-interviews-when-and-why-9ad38ee16ef5>
- Makawiel. (2021, August 18). *Explore How Fast is The Earth Dying*. Retrieved from Leakshare: <https://leakshare.org/explore-how-fast-is-the-earth-dying/>
- Migala, J., Nied, J., & Miller, K. (2020, November 5). Is The Beyond Burger Healthy? Registered Dietitians Weigh In. Women's Health. Retrieved November 30, 2021, from <https://www.womenshealthmag.com/food/a21566428/beyond-meat-burger-ingredients/>
- Milman, O. (2021, September 13). *Meat accounts for nearly 60% of all greenhouse gases from food production, study finds*. Retrieved from The Guardian: <https://www.theguardian.com/environment/2021/sep/13/meat-greenhouses-gases-food-production-study>

Resources

New Mexico. (2020). Retrieved from Data Commons:

https://datacommons.org/place/geoid/35?utm_medium=explore&mprop=count&popt=Person&hl=en

North America Population 2021 (Demographics, Maps, Graphs). (n.d.). World Population Review. Retrieved November 30, 2021, from

<https://worldpopulationreview.com/continents/north-america-population>

Quick Facts. (2021). Retrieved from Queen's University: <https://www.queensu.ca/about/quickfacts>

Reducing Meat Consumption to Tackle Climate Change - Why the Media Don't Talk About This Issue. (2016, March 14). Retrieved from OIPA:

<https://www.oipa.org/international/oipa-climate-change/>

Redman, R. (2020, September 18). *Online grocery to more than double market share by 2025*. *Supermarket News*. Retrieved November 30,

2021, from <https://www.supermarketnews.com/online-retail/online-grocery-more-double-market-share-2025>

Schiermeier, Q. (2019, August 12). *Eat less meat: UN climate-change report calls for change to human diet*. Retrieved from *Nature*:

<https://www.nature.com/articles/d41586-019-02409-7>

Starostinetskaya, A. (2021, April 7). *Vegnews*. Retrieved from VegNews: <https://vegnews.com/2021/4/seaspiracy-inspires-grocery-store-to-stop-selling-fish>

Stylianou, N., Guibourg, C., & Briggs, H. (2019, August 9). *Climate change food calculator: What's your diet's carbon footprint?* Retrieved from

BBC: <https://www.bbc.com/news/science-environment-46459714>

Tabrizi, A. (Director). (2021). *Seaspiracy* [Motion Picture].

Resources

- The New Double Diamond Design Process Is Here.* (2019, October 2). Medium. Retrieved November 30, 2021, from <https://medium.com/design-leadership-notebook/the-new-double-diamond-design-process-7c8f12d7945e>
- Wells, J., & Silverstein, S. (2021, April 22). *How 4 companies in the grocery industry are sharing sustainability progress.* Grocery Dive. Retrieved November 30, 2021, from <https://www.grocerydive.com/news/how-4-companies-in-the-grocery-industry-are-sharing-sustainability-progress/598727/>
- What is food ethics?* (2021). Retrieved from Food Ethics Council: <https://www.foodethicscouncil.org/learn/food-ethics/what-is-food-ethics/>
- Wunsch, N. (2020, November 25). • *Vegetarian and vegan population Canada 2018.* Statista. Retrieved November 30, 2021, from <https://www.statista.com/statistics/954924/number-of-vegetarians-and-vegans-canada/>