

Transform food waste into improved dietary nutrition



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THE CHALLENGE



Food loss and waste are major global issues that have significant impacts on food security, environmental sustainability, and economic dynamics. Annually, around one-third of all food produced for human consumption is lost or wasted, resulting in approximately 1.3 billion tons of loss.

18 %

Approximately 18% of cropland in USA is used to grow food that will end up as waste



- Each year, the US produces about 90 million tonnes of surplus food, which is estimated to cost \$444 billion in lost value.
- In 2021, 380 million tonnes of CO2 will be released as a result of excess food, accounting for 6% of all greenhouse gas emissions.
- As a result of the food surplus, the United States has lost about 22 trillion gallons of water each year.
- The equivalent of 149 billion servings of food remain unsold or uneaten as a result of US food surpluses.

Such a complex issue requires a multifaceted approach. My focus will be on losses within the agricultural and processed food sectors. I will consider produce such as fresh vegetables, pre-packaged salads, value-added vegetables, vegetable trays, pumpkins, and herbs.



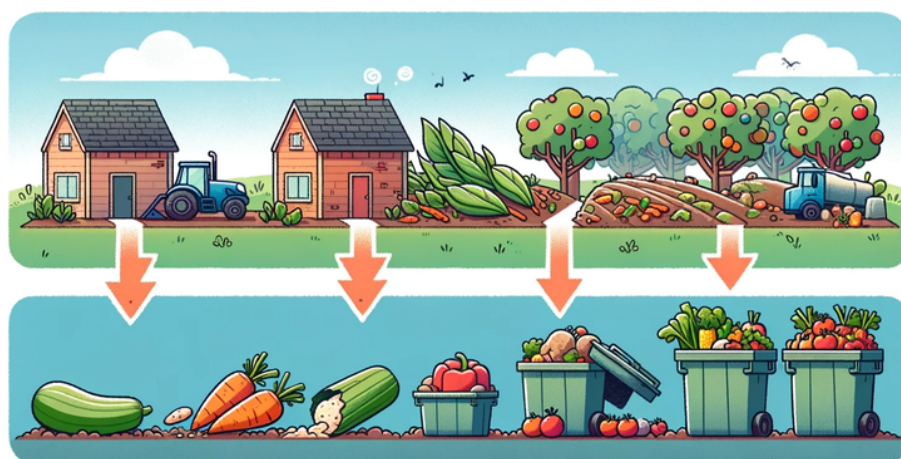
Cumulatively, about 18.5 million tons of produce is lost each year, from the time it is grown on farms to the time it is shipped from warehouses and processing plants to supermarkets.

Main causes of Product losses

Around 2.5% of the US energy consumption goes into producing food that is never eaten.

- Left Behind After Harvest
- Buyer Rejections
- Byproducts & Production Line Waste
- Unshipped Finished Product
- Packhouse Losses
- Fields Never Harvested

Intense market competition prompts these factors. Obtaining and processing top quality products is essential to meet rigorous market standards due to high price competition. Additionally, managing seasonal crops that ripen simultaneously is challenging.

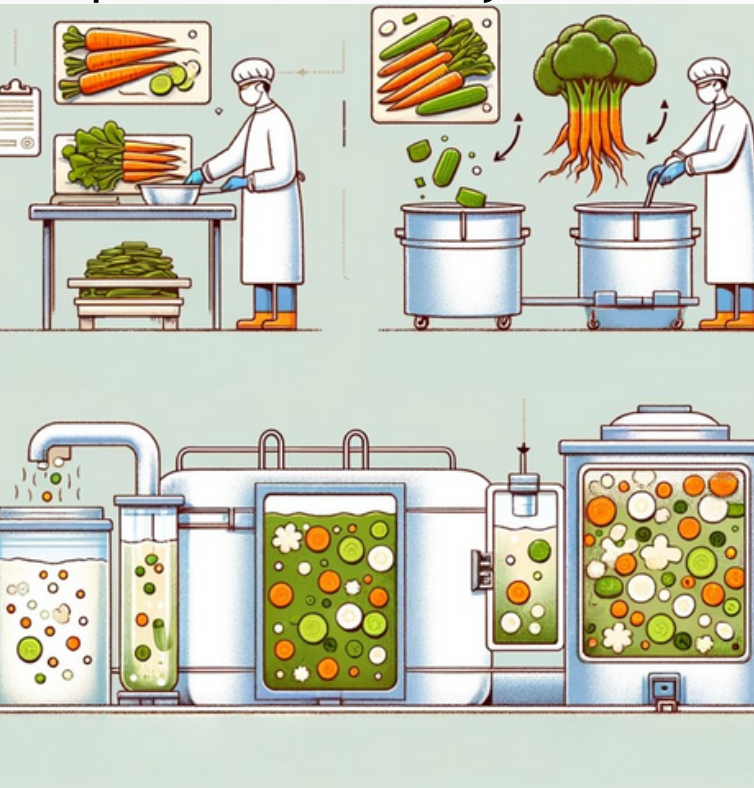




The Solution

Freeze-dried vegetable powder with vitamin B12

My solution is to create a vitamin B12 fortified vegetable powder from surplus vegetables, with a neutral taste suitable for use in food products such as sauces, soup dressings, and vegetarian alternatives like vegetable meat substitutes. This powder is an excellent fit for all products that may contain vegetables.



The solution is based on a fermentation technology comprising:

- 1) Cut the vegetables into pieces.
- 2) Place them in a vat with special lactic acid bacteria.
- 3) After two days of fermentation, remove the vegetables.
- 3) utilize freeze-drying to store the product for an extended period and make it easily consumable.

The fermentation process occurs without pre-pasteurization or the addition of water or other additives.

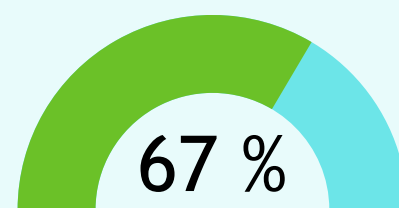
IS B12 REALLY THAT IMPORTANT? YES!

- The majority of vitamin B12 is present in animal-derived foods. Individuals who consume limited animal products or do not consume them at all should take B12 supplements or eat foods with added B12.
- B12 is an essential micronutrient necessary for functions such as maintaining the nervous system and blood cell formation. B12 deficiency can result in severe symptoms such as nerve damage, fatigue, neurological dysfunction, and digestive issues.

Dried vegetable powder with B12 is an affordable and environmentally friendly substitute for animal products that can perfectly replace meat and animal products. It efficiently utilizes vegetable waste without consuming water or emitting carbon dioxide, and significantly improves the diet of people who avoid animal products.



- Vegetable powder offers a complete nutritional solution.
- Vegetable powder provides essential nutrients such as vitamin B12, B11 (folic acid), K1 (phytomenadione), proteins, carbohydrates and fats.
- Our product ensures that individuals receive the necessary dose of vitamin B12 without relying on animal products.



10 grams of vegetable powder covers 67% of the daily allowance of vitamin B12 (2.4 mcg per day)

IMPLEMENTATION FEASIBILITY AND SCALABILITY

With effective production management and collaboration with vegetable processing and farming companies, this project has significant economic potential. This is due to the low cost of raw materials, minimal energy, and the high added value of the final product. Considering the substantial increase of people worldwide adhering to animal product-free diets and the expanding market of meat alternatives, the establishment of vegetable processing plants in various countries could present an efficient solution. This is due to the universality of processing conditions.

- There Are Almost 1.5 Billion Vegetarians Worldwide
- In 2023, 700,000 People Worldwide became a Veganuary
- Value of the plant-based food market crossed Worth \$9,4 Billion in the US in 2023 is projected to exceed \$35 billion by 2027
- Almost 8 Million Adults in the US Don't Consume Meat



CHALLENGES



Challenges in organizing production may involve substantial upfront investments and negotiating supply agreements with suppliers and vegetable producers. However, the investments will eventually pay off due to the increasing demand for our high-value product. By implementing circular production and collaborating with local vegetable producers, we can establish a mutually beneficial partnership. Additionally, locating our production facility in areas with a concentration of farms and processing plants will help resolve issues with vegetable supply.



FUTURE PROSPECTS



Due to the increasing awareness of environmental concerns surrounding the animal agriculture industry and the rising popularity of plant-based diets, the market for meat alternatives and vegetarian/vegan products is experiencing significant growth. In this scenario, producing vegetable porchetta can solve the issue of food overproduction and also become a lucrative business venture with a continuously expanding market.

References and Acknowledgements

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