

**TRANSDISCIPLINARY PROJECT CENTRIC LEARNING**

TD-PCL Research Report on **“A study on exploring sustainable solution for pet nutrition from food waste”.** submitted in partial fulfilment of the requirement for the award of the degree of

**Master of Business Administration (MBA)**

**GROUP NO : 170**

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**CERTIFICATE**

This is to certify that this TD-PCL report submitted to Faculty of Management Studies, CMS Business School, JAIN (Deemed-to-be University), Bangalore, by the following Students a record of project work done on the topic

**Part A - Title “A study on exploring sustainable solution for pet nutrition from food waste”.**

**Part B – Title “Plate to Paw: A Circular Economy-Based Business Model for Sustainable and Affordable Pet Nutrition in India”.**

This work was done during the academic year 2024 - 25, under my guidance and supervision.

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This TD-PCL report has not been submitted for the award of any Degree, Diploma, Associateship or Fellowship or any other title in this University or any other University.

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**DECLARATION**

I, hereby declare that this TD-PCL Project Report on

**Part A - Title “A study on exploring sustainable solution for pet nutrition from food waste”.**

**Part B – Title “Plate to Paw: A Circular Economy-Based Business Model for Sustainable and Affordable Pet Nutrition in India”.**

is prepared by us during the academic year 2024 - 25 under the guidance of **Dr. Tejaswini S** This report is not based on any previously submitted project for the award of Degree or Diploma offered by any University. It is the result of our own effort.

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**NO OBJECTION FOR PUBLICATION / IPR PROCESSING**

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was completed at Faculty of Management Studies, CMS Business School, JAIN (Deemed-to-be University) under the supervision of **Dr. Tejaswini S**

We have no objection if the University uses the contents for any kind of publication – print/online, including but not limited to IPR-related processing in the future. We hereby, authorize the University authorities to take all decisions pertaining to the same and will abide by their decisions.

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**PART – A: RESEARCH REPORT**

**“A study on exploring sustainable solution for pet nutrition from food waste”.**



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**Executive Summary**

Plate to Paw: Sustainable Transformation in Pet Nutrition is an initiative focused on converting food waste into organic pet food, addressing both environmental sustainability and social responsibility. This innovative project transforms surplus food from restaurants and food industries into high-quality, organic pet food, reducing landfill waste and lowering greenhouse gas emissions. The model follows a dual-approach strategy: 80% of the production is revenue-generating, ensuring financial sustainability, while 20% is allocated for Corporate Social Responsibility (CSR), providing affordable pet food to low-income pet owners and animal shelters.

The project works by harvesting food waste, converting it into healthy and safe pet food through innovative methods, and distributing it through commercial as well as CSR channels. Commercial revenue will drive operations and enable long-term scalability. The CSR component provides nutrition to vulnerable populations and rescued animals, thereby reinforcing social impact.

Through combining sustainability with economic feasibility, Plate to Paw establishes a circular economy that serves the interests of businesses, communities, and the environment. The initiative not only adds to responsible waste management but also improves pet nutrition accessibility, thereby contributing significantly to the industry and society

1. **INTRODUCTION**
	1. **Background of the study**

The increasing global population and demand for food have led to significant food waste generation, causing environmental and economic challenges. According to the Food and Agriculture Organization (FAO), approximately one-third of all food produced globally is wasted, which translates to about 1.3 billion tons annually. This waste not only contributes to greenhouse gas emissions but also represents a missed opportunity to feed both humans and animals in need. Concurrently, the pet food industry faces sustainability concerns due to its reliance on resource-intensive ingredients that compete with human food systems. Traditional pet food production often involves the use of meat and grains that require extensive agricultural inputs, leading to deforestation, water scarcity, and biodiversity loss.

Addressing these challenges, initiatives like "Plate to Paw" propose innovative solutions by converting surplus food into organic pet food. This approach not only reduces landfill waste and greenhouse gas emissions but also promotes social responsibility by providing affordable nutrition to low-income pet owners and animal shelters. The dual-approach strategy of this initiative—where 80% of production is revenue-generating while 20% is allocated for Corporate Social Responsibility (CSR)—ensures financial sustainability while making a positive social impact.

Furthermore, the concept of a circular economy is central to this study. By transforming waste into valuable resources, we can create systems that are not only economically viable but also environmentally friendly. The integration of sustainability into pet nutrition aligns with growing consumer preferences for eco-friendly products, as pet owners increasingly seek brands that prioritize ethical sourcing and environmental stewardship.

This study aims to explore the feasibility of using food waste as a sustainable source for pet nutrition, emphasizing circular economy principles and environmental stewardship. By investigating the potential benefits and challenges associated with this innovative approach, we hope to contribute valuable insights into the future of sustainable pet food production and its role in addressing broader environmental and social issues. Through this research, we aim to highlight how initiatives like "Plate to Paw" can serve as a model for transforming the pet food industry while fostering responsible waste management practices that benefit both communities and the planet.

Additionally, this study will delve into consumer attitudes toward sustainable pet food options, examining factors such as perceived value, nutritional quality, and willingness to pay for eco-friendly products. Understanding these dynamics is crucial for developing effective marketing strategies that resonate with environmentally conscious consumers. Ultimately, by bridging the gap between food waste management and pet nutrition, this research seeks to pave the way for innovative solutions that enhance sustainability within the pet industry while addressing pressing societal challenges related to food security and environmental degradation.

1. **Literature Review**

The main aim of this chapter is to provide more information about sustainable solutions for pet nutrition from food waste. For literature review information is collected from articles.

* 1. **Low-Cost Waste Valorization in Pet Food Production**

A case study by a renowned food and beverage company, published on September 29, 2023, highlighted the potential of low-cost waste valorization for pet food production. The study identified alternative ingredients derived from waste streams in food and agriculture that are AAFCO-approved, affordable, and sustainable. This approach demonstrated significant cost savings and environmental benefits while maintaining high-quality standards in pet food production.

* 1. **Environmental Benefits of Meat Fraction Valorization**

Published on April 15, 2021, this study evaluated the use of meat fractions from packaged food waste in pet food production. It found that replacing slaughter-derived meat with valorized waste reduced greenhouse gas emissions by 56.40%, land use by 87.50%, and water consumption by 22.62%. The research aligns with Sustainable Development Goals (SDGs) 2, 12, and 13, showcasing the environmental sustainability of such practices.

* 1. **Valorization of Food Waste as Animal Feed**

Nath et al., in a review published on April 16, 2023, discussed the potential of converting food waste into animal feed to address challenges like waste management and food security. The study emphasized the role of advanced treatment methods in producing high-quality feed while contributing to the circular bioeconomy. It also highlighted the importance of ensuring safety and nutrient consistency in feed production.

* 1. **Circular Bioeconomy Through Food Waste Recycling**

A study published on October 18, 2021, explored pathways for agri-food waste valorization within a circular bioeconomy framework. The research focused on recycling organic waste into valuable resources like animal feed, reducing natural resource usage and environmental pollution. It emphasized the need for institutional support to scale such practices.

* 1. **Feasibility of Pet Food from Food Waste in Europe**

Research published in 2022 evaluated the feasibility of using food waste as feedstuff for pets within the European Union's regulatory framework. The findings revealed that pet food derived from food surplus is nutritionally valuable and compliant with EU safety standards. This approach has significant potential to reduce landfill waste while addressing sustainability goals.

* 1. **Triple Bottom-Line Evaluation of Animal Feed Production**

A study published on September 5, 2022, used a triple-bottom-line framework to assess the environmental, economic, and social impacts of producing animal feed from food waste. It demonstrated that at a recovery rate of 13.8%, this practice saves resources like water and reduces greenhouse gas emissions while being economically viable.

* 1. **Sustainable Food Waste Management for Animal Feed**

Another review by Nath et al., published on April 16, 2023, highlighted the advantages of turning food waste into animal feed as a sustainable solution to reduce environmental impacts and enhance food security. The study emphasized creating a closed-loop system that minimizes resource use and pollution while promoting circular economy principles.

1. **Research Methodology**
	1. Introduction

The increasing problem of food waste and the escalating price of pet nutrition call for sustainable alternatives. This research examines the conversion of food waste into nutritionally balanced, pet-safe feed, ensuring safety, digestibility, and regulatory compliance. The methodology defines the collection, processing, and enrichment of food waste to yield high-quality animal feed.

* 1. Research Design

This study takes an experimental and analytical method to create an optimized process for converting food waste. The research consists of food waste analysis, formulation, testing, and evaluation for nutritional value, safety, and pet acceptability.

* 1. Data Collection & Waste Segregation

The main data for this research consists of food waste collected from restaurants, homes, and supermarkets. The waste is classified into groups depending on nutritional content and suitability for pet consumption.

Inclusions:

* Fruits & vegetable peels
* Grains (bread, rice, pasta, wheat bran)
* Dairy waste (cheese, yogurt, non-spoiled milk)
* Cooked or processed meat peels (if legally allowed) Exclusions:
* Toxic foods for pets (onions, garlic, grapes, chocolate)
* Extremely processed junk food with additives
* Moldy, rotten, or spoiled food

Food waste is kept in sealed, temperature-controlled containers to avoid contamination prior to processing.

* 1. Processing & Nutritional Enhancement

Collected food waste is treated with a series of processes to render it safe and improve its nutritional content.

* + 1. Pre-Processing

•Chopping and grinding the waste into equal sizes.

•Heat treatment (pasteurization at 85°C for 30 minutes) to destroy bacteria and pathogens.

* + 1. Nutritional Supplementation

To satisfy pet dietary requirements, the processed food waste is supplemented with:

* Proteins: Fish meal, soybean meal, or plant proteins.
* Carbohydrates: Wheat bran, rice husk, or whole grains for energy.
* Healthy Fats: Fish oil or flaxseed oil for healthier coat and digestion.
* Vitamins & Minerals: Calcium, phosphorus, and trace minerals to maintain balanced nutrition.
* Probiotics & Enzymes: Included for digestion and gut health.
	1. Preservation & Storage

Two storage methods are tried to identify the best method for longevity and quality:

1. Drying:
	* Dehydration to lower moisture content (10-12% for long shelf life).
	* natural preservatives such as bentonite clay or citric acid to avoid spoilage. 2.Fermentation:
	* Lactic acid bacteria culture to boost probiotic content.
	* Storage in airtight containers for controlled fermentation.

Storage tests are carried out in varying conditions (ambient, refrigerated, and frozen) to find the best preservation method.

* 1. Testing & Quality Control

The treated feed is put under nutritional and microbial testing to ascertain safety and efficacy.

* + 1. Laboratory Testing Nutritional Analysis:
			- Protein, fat, carbohydrate, fiber, and moisture content analysis. Microbial Safety:
			- Detection of Salmonella, E. coli, and mold contamination.
		2. Pet Feeding Trials
			- Small amounts of the feed are fed to pets (dogs/cats) under the supervision of a veterinarian.
			- Observations are noted on palatability, digestion, and general health impact.
	1. Ethical Considerations & Compliance
* All tests adhere to ethical animal feeding practices.
* The study meets local pet food safety requirements.
	1. Data Analysis & Optimization

The data obtained from nutritional testing, storage stability, and pet trials are compared to optimize the formula and design an ideal pet feed composition. The following changes are made according to:

* The nutritional deficiencies observed during testing.
* Pet acceptability and digestibility results.
* Shelf-life stability according to preservation methods.
	1. Conclusion

This research strategy offers a mechanistic method to transform food waste into pet-safe feed, which is safe, sustainable, and nutritionally sufficient. The improved process can help minimize food waste and provide a cost-effective, environmentally friendly pet food option.

1. **DATAANALYSIS AND INTERPRETATION**
2. **Age group**

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**Analysis:**

A survey of 53 individuals reveals a clear concentration within younger age groups. The largest portion, 41.5%, consists of people aged 18-22, highlighting a significant presence of young adults. Nearly as many, 34%, are aged 23-25, suggesting a strong representation of those in the early stages of their careers or recent graduates. Only 18.9% are over 25, likely reflecting individuals with more professional experience. The youngest segment, 13-17 year old, makes up the smallest group.

**Interpretation:**

In essence, the survey predominantly captured responses from young adults and those in their early careers. This age profile might be intentional, based on the survey's focus (perhaps education, career, or youth-related topics). However, the limited number of older participants may restrict how broadly the findings can be applied.

1. **Gender**

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**Analysis:**

A survey of 53 people reveals a predominantly female participation, with 60.4% identifying as women. Men account for 34%, showing a considerable difference in gender representation. A small group chose not to reveal their gender. The "Other" category is not visible, suggesting minimal or no representation.

**Interpretation:**

Essentially, the survey responses are heavily skewed towards females. This imbalance might be due to the survey's focus, who it targeted, or how people chose to respond. The large female majority implies the results might primarily reflect female viewpoints. The option to decline to state gender, though chosen by few, is important for inclusivity

1. **Do you have a pet at home?**

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**Analysis:**

A survey of 53 people asked about pet ownership. The results show that more than half, specifically 58.5%, do not have pets at home. Conversely, 41.5% reported owning pets.

**Interpretation:**

Essentially, the survey reveals a higher proportion of non-pet owners among the respondents. This could be attributed to several reasons, including housing limitations, personal choices, or financial considerations. The noticeable difference between the two groups implies a distinct pattern within this sample, possibly reflecting a specific group of people or location where pet ownership is less frequent.

1. **How often do you dispose of food waste/byproducts?**

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**Analysis:**

A survey of 54 people shows that over half, 51.9%, discard food waste every day. Nearly a quarter, 22.2%, do so weekly. Around 18.5% dispose of food waste monthly, while only 7.4% rarely do so.

**Interpretation:**

Essentially, most respondents deal with food waste daily, suggesting a need for robust daily waste collection. A significant number also handle it weekly, indicating a need for weekly waste management solutions. The remaining small groups, who dispose of food waste monthly or rarely, point to varying waste handling practices and potential areas for improving waste reduction and disposal awareness.

. **5. Would you be willing to partner with a company that collects food waste for**

**repurposing?**

****

**Analysis:**

A survey of 54 people asked about their willingness to partner with a company collecting food waste for reuse. Half of the respondents, 50%, said they would be willing to partner. Nearly a third, 31.5%, indicated they might partner depending on the circumstances. Only 18.5% said they would not partner.

**Interpretation:**

Essentially, a majority of people are open to partnering for food waste repurposing. A significant portion are open to the idea, but with conditions, highlighting the importance of clear and attractive terms. The small group who declined suggests a need to address any concerns or resistance. Overall, the results show a strong potential for successful food waste repurposing partnerships.

1. **What methods do you currently use for food waste disposal?**

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**Analysis:**

A survey of 54 people in Bengaluru, Karnataka, India, about their food waste disposal methods reveals that half of the respondents compost their food waste. A significant number, 40.7%, send food waste to landfills. Nearly a third, 31.5%, donate food waste. A small fraction, 5.6%, use other methods, while even fewer (1.9% each) resort to inappropriate disposal or rely on local municipal services (BBMP).

**Interpretation:**

In essence, composting is the most popular food waste disposal method, suggesting a positive trend towards sustainability. However, landfill use remains high, indicating a need for more sustainable options. Food donation is also practiced by a notable portion, showing community- oriented waste management. The few instances of improper disposal highlight the need for further education and awareness

1. **What challenges do you face in food waste disposal?**

****

**Analysis:**

A survey of 54 people in Bengaluru, Karnataka, India, regarding food waste disposal challenges reveals that over half, 53.7%, do not experience any difficulties. A quarter of respondents, 25.9%, struggle with the lack of adequate disposal facilities. Approximately 16.7% find government regulations challenging. Other issues, such as high disposal costs, were mentioned by a smaller number of people.

**Interpretation:**

Essentially, most respondents in Bengaluru find food waste disposal manageable. However, the significant number who cite a lack of proper facilities points to a potential need for improved waste infrastructure. The concern about government regulations suggests a need for clearer guidance on waste management rules. The low prevalence of other issues indicates they are not primary concerns for this group.

1. **How much food waste do you generate per week?**

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**Analysis:**

A survey of 54 people in Bengaluru, Karnataka, India, about their weekly food waste generation reveals that over half, 55.6%, produce less than 5 kg. Nearly a third, 31.5%, generate between 5-20 kg. About 9.3% produce 20-50 kg, and a very small fraction generates over 50 kg.

**Interpretation:**

In essence, the majority of respondents in Bengaluru generate a small amount of food waste weekly. A significant portion produces a moderate amount, highlighting the potential for waste reduction efforts. The smaller groups generating larger amounts may represent different demographics or businesses, requiring tailored waste management approaches. The overall data suggests a need for education and promotion of strategies to minimize food waste.

1. **What price range would you be willing to pay for sustainable pet food compared to regular pet food?**

****

**Analysis:**

A survey of 54 people in Bengaluru, Karnataka, India, explored their price sensitivity for sustainable pet food. Nearly half, 42.6%, are willing to pay the same price as regular pet food. Almost a third, 31.5%, would pay 10% more. 18.5% are open to paying 20% more, while only 7.4% are unwilling to pay any extra.

**Interpretation:**

In essence, a significant portion of respondents in Bengaluru are ready to buy sustainable pet food at the same price as regular pet food. Many are also willing to pay a small premium, indicating a potential market for moderately priced sustainable pet food. A smaller group is willing to pay a higher premium, suggesting a niche market. The small percentage unwilling to pay more suggests a need to emphasize non-price benefits of sustainable pet food.

1. **Through which platform do you prefer to purchase pet food?**

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**Analysis:**

A survey of 54 people in Bengaluru, Karnataka, India, about their preferred pet food purchasing platforms shows that 35.2% prefer to buy from all available options (online, pet shops, vets, supermarkets). Both online platforms and veterinary stores are favoured by 18.5% each. Pet shops are preferred by 16.7%. Other categories, such as those who don't own pets or prefer home-cooked food, represent smaller percentages.

**Interpretation:**

Essentially, many respondents in Bengaluru utilize multiple channels to purchase pet food, indicating a preference for convenience. Online platforms and veterinary stores are popular choices, highlighting their growing importance. Traditional pet shops still hold a significant share, suggesting some consumers value in-person shopping. The inclusion of non-traditional categories suggests the survey captured a diverse range of responses.

1. **Do you believe repurposing food waste into pet food can help reduce environmental waste?**

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**Analysis:**

A survey of 54 people in Bengaluru, Karnataka, India, asked about their belief in the environmental benefits of repurposing food waste into pet food. Over half, 57.4%, believe it can help reduce waste. About a quarter, 25.9%, do not believe it has a positive impact. 16.7% are unsure.

**Interpretation:**

Essentially, a majority of respondents in Bengaluru believe repurposing food waste into pet food is beneficial for the environment. However, a significant portion either disagrees or is unsure, indicating a need for greater awareness and education on the subject. The strong positive response suggests potential support for initiatives promoting this practice.

1. **How aware are you of the issue of food waste?**

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**Analysis:**

A survey of 54 people in Bengaluru, Karnataka, India, regarding their awareness of food waste issues shows that 42.6% are "Somewhat aware". 37% are "Very aware". 14.8% are "Slightly aware", and a smaller percentage are "Not aware at all."

**Interpretation:**

Essentially, the survey indicates a moderate to high level of awareness about food waste among respondents in Bengaluru. However, a significant portion has limited knowledge, highlighting the need for educational initiatives. The "Somewhat aware" group represents a key target for further information and action. The data underscores the importance of continued efforts to increase awareness and promote sustainable food practices.

1. **How important is sustainable nutrition for pets to you?**

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**Analysis:**

A survey of 54 people in Bengaluru, Karnataka, India, regarding the importance of sustainable pet nutrition shows that 44.4% consider it "Very important". 35.2% find it "Somewhat important". 18.5% consider it "Not very important", and a small percentage find it "Not important at all."

**Interpretation:**

Essentially, a significant portion of respondents in Bengaluru prioritize sustainable nutrition for their pets. A substantial number find it moderately important, suggesting potential for growth in awareness. The minority who find it less important or not important at all highlight the need for education on the benefits of sustainable pet food. The data suggests a growing trend towards environmentally conscious pet care in the region.

1. **How often do you dispose of leftover or wasted pet food?**

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**Analysis:**

A survey of 54 people in Bengaluru, Karnataka, India, about how often they dispose of leftover or wasted pet food shows that 37% do so weekly. 35.2% dispose of it daily. 16.7% dispose of it monthly, and 11.1% rarely do so.

**Interpretation:**

Essentially, a significant portion of respondents in Bengaluru dispose of pet food waste either daily or weekly, indicating a frequent need for waste management. The near-equal distribution between daily and weekly disposal suggests a consistent pattern of waste management. The smaller percentages for monthly and rare disposal point to diverse waste handling practices and potential areas for improving waste reduction and disposal awareness.

1. **How could initiatives like Plate to Paw impact the pet food industry?**

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**Analysis:**

A survey of 54 people in Bengaluru, Karnataka, India, asked about the potential impact of initiatives like "Plate to Paw" on the pet food industry. Nearly half, 46.3%, believe it would have a positive impact by promoting sustainability. About a third, 31.5%, believe it would have no significant impact. 14.8% are unsure, and only 7.4% believe it would have a negative impact.

**Interpretation:**

Essentially, a majority of respondents in Bengaluru see sustainability initiatives like "Plate to Paw" as beneficial for the pet food industry. A significant portion believes they would have no impact, suggesting a need for more information. The small percentage who see a negative impact suggests limited concerns about disruption. The data points to a potential market for and acceptance of sustainability-focused innovations in the pet food sector.

1. **Would you be more likely to purchase pet food from a company that actively supports social causes, such as helping low-income pet owners?**

****

**Analysis:**

A survey of 54 people in Bengaluru, Karnataka, India, asked about their likelihood of purchasing pet food from a company that supports social causes. Over half, 51.9%, said they would definitely be more likely to purchase. Nearly 30%, 29.6%, said they would be more likely, but it wouldn't be the deciding factor. 14.8% said it wouldn't influence their decision, and a small portion were unsure.

**Interpretation:**

In essence, a majority of respondents in Bengaluru favor pet food companies that support social causes. While many see it as a significant factor, others view it as a secondary consideration. A notable portion is not influenced by social causes when purchasing pet food. The data suggests a potential market for socially responsible pet food brands, but also highlights the importance of understanding diverse consumer preferences.

1. **Would you be willing to participate in a program that collects food waste from households to create pet food?**

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**Analysis:**

A survey of 54 people in Bengaluru, Karnataka, India, asked about their willingness to join a program collecting household food waste for pet food production. 40.7% said they would definitely participate. 38.9% said they would participate, but only if it's convenient. 13% said they wouldn't participate, and 7.4% were unsure.

**Interpretation:**

Essentially, a significant portion of respondents in Bengaluru are willing to participate in a food waste collection program for pet food. However, convenience is a major factor for a large segment. A notable minority is unwilling to participate, and some are unsure, highlighting the need for clear program details and addressing potential concerns. The data suggests a potential for success if the program is designed with user convenience in mind.

1. **Findings and Recommendations**
	1. **Demographics and Survey Respondents:**
		* The survey was predominantly answered by young adults, with 41.5% aged 18-22 and 34% aged 23-25.
		* Female respondents (60.4%) outnumbered male participants (34%), indicating a gender skew in responses.
	2. **Pet Ownership Trends:**
		* 41.5% of respondents own pets, while 58.5% do not.
		* This suggests a potential market among pet owners but also highlights the need to educate non-pet owners on the benefits of sustainable pet food.
	3. **Food Waste Management Practices:**
		* More than half (51.9%) of respondents dispose of food waste daily.
		* Composting (50%) is the most common method of disposal, followed by landfill use (40.7%).
		* 31.5% of respondents donate food waste, indicating a willingness to repurpose food scraps.
	4. **Challenges in Food Waste Disposal:**
		* 53.7% of respondents face no significant challenges in waste disposal.
		* 25.9% cite inadequate disposal facilities as a concern, and 16.7% struggle with government regulations.
	5. **Attitude Towards Food Waste Repurposing:**
		* 50% of respondents are open to partnering with food waste repurposing companies.
		* 57.4% believe repurposing food waste into pet food can reduce environmental waste.
		* 42.6% are somewhat aware of food waste issues, while 37% are highly aware, indicating a fair level of consciousness.
	6. **Sustainable Pet Food Market:**
		* 42.6% of respondents are willing to pay the same price for sustainable pet food as regular pet food.
		* 31.5% are open to paying 10% more, while 18.5% would pay 20% more.
		* 44.4% of respondents consider sustainable nutrition for pets very important, suggesting a strong demand for environmentally friendly products.
	7. **Consumer Buying Preferences:**
		* 35.2% of respondents prefer to purchase pet food from all available platforms.
		* Online stores (18.5%) and veterinary shops (18.5%) are also preferred, showing a diverse distribution in purchasing behavior.
	8. **Waste Reduction and Social Impact:**
		* 46.3% believe initiatives like "Plate to Paw" could positively impact the pet food industry.
		* 51.9% are more likely to purchase pet food from companies that support social causes.
		* 40.7% are willing to participate in food waste collection programs for pet food production, while 38.9% would participate if it’s convenient.

**Recommendations**

1. **Increase Awareness and Education:**
	* Conduct educational campaigns on the benefits of food waste repurposing.
	* Promote the environmental and health benefits of sustainable pet food through social media and community outreach.
2. **Expand Collection and Processing Infrastructure:**
	* Address the lack of adequate food waste disposal facilities by partnering with municipal corporations.
	* Ensure convenient collection programs to encourage greater participation.
3. **Enhance Consumer Engagement and Incentives:**
	* Offer incentives (discounts, loyalty points) to consumers who contribute food waste for pet food production.
	* Provide transparency in processing and safety measures to build trust among pet owners.
4. **Develop Competitive Pricing Strategies:**
	* Since 42.6% of consumers are only willing to pay the same price as regular pet food, pricing must remain competitive.
	* Introduce tiered pricing for premium and budget-friendly sustainable pet food options.
5. **Leverage Multiple Sales Channels:**
	* Strengthen online sales platforms while maintaining partnerships with veterinary clinics and pet shops.
	* Introduce subscription models for sustainable pet food to increase long-term customer retention.
6. **Improve Product Appeal and Acceptance:**
	* Conduct further trials on pet acceptability and digestibility to refine formulas.
	* Offer free samples or trial packs to encourage first-time purchases and gather customer feedback.
7. **Encourage Social Responsibility in Pet Food Brands:**
	* Partner with NGOs and animal welfare organizations to support low-income pet owners.
	* Highlight corporate social responsibility initiatives to attract ethically conscious consumers.
8. **Strengthen Regulatory Compliance and Safety Measures:**
	* Ensure all production and processing comply with local pet food safety regulations.
	* Maintain stringent quality control, including microbial and nutritional testing, before market launch.
9. **Conclusion**

This study explores the potential of repurposing food waste into nutritionally balanced and pet-safe feed, addressing both environmental sustainability and cost-effective pet nutrition. The research methodology effectively outlines the collection, processing, and enhancement of food waste while ensuring compliance with safety and regulatory standards.

Survey findings indicate a growing awareness and willingness among consumers to support sustainable pet food alternatives. While food waste disposal remains a challenge due to inadequate facilities and regulatory constraints, there is significant interest in waste repurposing initiatives. Additionally, consumer responses suggest a market for sustainable pet food, especially when priced competitively and linked to social causes.

The data analysis highlights the necessity for optimizing food waste processing techniques to maintain nutritional integrity and storage stability. Furthermore, the findings emphasize the importance of consumer education and convenience in ensuring the success of sustainability-driven initiatives like food waste-to-pet food programs.

In conclusion, this research underscores the viability of food waste transformation into

pet feed as a sustainable and ethical solution. By addressing key challenges such as waste segregation, preservation, and public engagement, businesses and policymakers can foster a circular economy approach. Future research should focus on scaling production, improving consumer trust, and evaluating long-term benefits for both pet health and environmental impact.

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