

Reduction of waste avocados in Kenya



Part of the FORQLAB project

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FORQLAB = Food Waste Reduction
and Food Quality Living Lab in Kenya

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Project introduction:

FORQLABS is an initiative done in collaboration with Kenyan and Dutch universities, stakeholders from the dairy and avocado chains, and various other organizations. This project runs over a three-year period, students from six universities will work together to develop viable end products for the FORQLABS group to meet their aims. The project "Reduction of waste avocados in Kenya", was undertaken as part of the FORQLAB sustainability initiative, it aims to establish a more sustainable model for avocados in Kenya. The project focuses on reducing waste and improving processes throughout the supply chain. The main objective is to improve production processes, waste management, and marketing for 80% of small-scale farmers in the Nandi region of Kenya, benefiting both farmers and the entire supply chain.

This abstract provides an overview of the research report, summarizing key chapters and findings. It begins with a description of the initial research conducted to understand avocado waste within the Kenyan supply chain. Desk research, interviews, and excursions to industry companies were conducted, along with small-scale experiments on avocado oil extraction. A trip to Kenya was undertaken to gain firsthand knowledge of the supply chain, this took thorough preparation and research. The characteristics, types, nutritional value, health benefits, and advantages of avocado oil in cosmetics are discussed, along with the locations of avocado production in Kenya and the advantages provided by factors such as rainfall, harvesting season, and volcanic soil. The role of the Nandi Avocado Cooperation in the market and how they address challenges in Nandi County is also highlighted.

Research questions and methodology

The main research question of the project revolves around using avocado waste more efficiently in Kenya to add economic value and increase sustainability by developing products from the waste. The methodology for this research involves answering sub-questions related to growth management, waste management, and market investigation. These sub-questions explore topics such as improving crop management processes, understanding certification requirements and benefits to farmers, defining quality specifications for the European export market, identifying waste in the avocado sector, developing an alternative product from avocado waste, formulating a recipe for the potential product, identifying areas for improvement, selecting the most viable product, determining suitable markets (export or local), and planning marketing strategies and development processes. The methodology integrates literature research, desk research, field studies, interviews with farmers and industry partners, consumer surveys, and market analysis to gather the necessary information and develop a comprehensive blueprint for the project.

Definition avocado waste

The research report presents the results of the study on waste management within the avocado sector in Kenya. Initially, the definition of waste in the avocado sector was unclear due to varying interpretations across the supply chain which led to inconclusive results. Following a fieldtrip to Kenya, waste is defined as all avocados classified as grade 2 as they fetch such a low price. Grade 1 avocados, which meet the specific criteria set by exporters, are of the highest quality and mainly used for the export market, commanding a higher price. In contrast, grade 2 avocados exhibit lower quality, displaying physical damage or other issues, and are primarily used for oil production. The Nandi Avocado Cooperative purchases grade 2 avocados from farmers at a lower price.

Growth management

The study also found a significant knowledge and resource shortages among farmers in the avocado supply chain in Nandi, Kenya. This poses challenges for farmers as they struggle to produce avocados of the desired quality for the market. To address this issue, a growth management blueprint was developed, providing step-by-step guide on avocado cultivation and quality improvement. The blueprint emphasizes land assessment, considering factors such as altitude, climate, soil drainage, and pH levels. It also covers land preparation, seedling sourcing, planting techniques, pollination, harvesting practices, mulching, pruning, irrigation, disease and pest control, post-harvest handling, and storage techniques. Implementation of the growth management blueprint is expected to result in improved avocado quality, increased productivity, and reduced waste.

Marketing investigation and waste management

The report includes a detailed market investigation to select the most suitable product for development using rejected avocados. Consumer preferences, market trends, and potential profitability were considered during the product selection process. The investigation revealed a growing demand for sustainable and natural cosmetic products containing avocado oil (see figure 1), aligning with the global shift towards eco-friendly and organic cosmetics. Avocado oil is rich in vitamins, antioxidants, and fatty acids, making it a valuable ingredient for skin and hair care products (see figure 2). The report discusses the potential benefits and challenges associated with avocado oil production, highlighting the need for further research in scaling up production and optimizing the extraction process (see table 1).

Would you be willing to purchase an avocado oil cosmetic product?
45 antwoorden

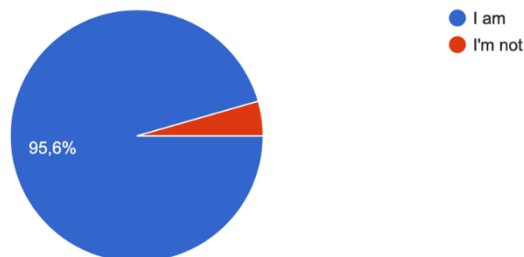


Figure 1: Survey (N=45)

Avocado Oil

Skin

- Rich in oleic acid & Vitamin E and C
- Highly anti-inflammatory
- Deeply nourishing
- Perfect for very dry skin

Hair






- Capable of penetrating deep in hair shaft
- Prevents breakage
- Balances scalp



More info

Figure 2: Benefits avocado oil hair and skin; (Bee, 2023)

Table 1: Step by step guide

Step:		Visualisation:	Needed material:
1	Make sure the avocados are (over)ripe before starting		
2	Depit and peel the avocados		<ul style="list-style-type: none"> - Knife - Spoon
3	Puree the avocado flesh		<ul style="list-style-type: none"> - Hand blender or spoon
4	Warm the puree for 90 minutes at 40-50°C		<ul style="list-style-type: none"> - Pot - Stove - Timer - Thermometer
5	Scoop the mixture in the cheesecloth		<ul style="list-style-type: none"> - Cheesecloth - Gloves are recommended
6	Squeeze into the cheesecloth to strain the oil		<ul style="list-style-type: none"> - Cheesecloth - Gloves are recommended

Export criteria

Furthermore, the research report looks into the requirements needed for exporting avocados to the European Union (EU). Compliance with EU regulations is crucial for market access. The report provides an overview of EU regulations regarding quality, food safety, and traceability. It highlights the importance of Good Agricultural Practices (GAPs), Global G.A.P. certification, and integrated pest management systems to meet EU standards. Understanding these requirements is vital for small-scale farmers to enhance their export opportunities and gain a competitive edge in the market.

Recommendations

Based on the findings and analysis, the research report provides recommendations for addressing the issue of waste in the Kenyan avocado industry. These recommendations focus on implementing the growth management blueprint, fostering knowledge exchange and training programs for farmers, strengthening the Nandi Avocado Cooperative, improving waste management practices, enhancing traceability systems, fostering collaboration between avocado and dairy cooperatives, establishing avocado oil extraction facilities, and developing effective marketing strategies. By adopting these recommendations, the Kenyan avocado industry can reduce waste, enhance product quality, increase profitability, and contribute to a more sustainable and economically viable future.

Conclusion

In conclusion, the research report on "Reduction of waste avocados in Kenya" emphasizes the significance of implementing the findings and recommendations to transform the Kenyan avocado industry. The growth management blueprint, EU export requirements, avocado oil production potential, and marketing strategies discussed in the report have the potential to improve the industry in Kenya. By addressing waste management, improving quality, and strengthening market access, the Kenyan avocado sector will continue to grow, creating value for farmers and stakeholders, and promote sustainable development.