

High Quality Cassava Peels (HQCP) as Animal Feed

Introduction

In Rwanda, cassava peels are usually thrown away, contributing to waste accumulation and causing health and environmental problems. At the same time, the country faces an increased demand for affordable animal feed to support the growth in livestock sub-sector driven by rapid urbanization. The RUNRES Project supported AKANOZE Nyamiyaga, a small cassava processing company, to pilot an innovation that valorizes the cassava peels through processing into HQCP. This innovation provides a good alternative source of carbohydrates in the formulation of animal feed while contributing to reducing environmental nuisance. This HQCP factsheet contains essential information on the innovation, final products and quality, customers, and investment requirements.



Cassava peels flour

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Innovation technical description

The production of the HQCP is a low-tech innovation with a simple grater, press, and dryer that can be found locally. The whole setup can be installed in a small shelter with a ground outside that serves to dry the cassava mash, offloading the raw materials and loading the final product. Based on the installed processing capacity, the innovation requires a few permanent employees and casual labor. The cost-effective innovation process helps remove water and cyanides to produce nutritious animal feed.

HQCPF processing flow

AKANOZE collects cassava peels from its cassava roots processing unit and from cassava farmers - peels are transported to the processing site - remnants of soil must first be removed - Cassava peels are conveyed into the grater to be turned into a coarse mash - then the mash is fed into the press to remove water and cyanides - after the press, the wet mash (30-40% of initial weight of peels) can be fed animals or dried on the sun - the dried mash is passed through a milling machine to be grounded into a fine flour that can be mixed with other ingredients to produce animal feed.



Partners and staff

Key partners of the innovations are SCD (donor), IITA (implementor), ETH (research), suppliers of the raw materials (cassava peels), buyers of final products, i.e. livestock farmers, the Rwanda Standards Board, and the Rwanda Agriculture Board.

The processing unit is operated by 5 permanent staff (3 men and 2 women) among which 4 are youth and the innovation uses an average of 12 casual laborers monthly, mostly female.

Products and Key Nutrients

Cassava peels are processed into a wet coarse mash with a low content of cyanides and water. The cassava mash can be ground and dried to produce HQCPF.

- Coarse mash has a lower energy content and higher fiber content.
- Dry HQCPF is higher in energy content and lower in fiber content.
- Cyanides must be below 10 ppm (parts per million).
- Aflatoxins must be below 20ppb (parts per billion).
- Protein content is low below 5%.
- Water content must be below 42% for wet cake and 12% for HQCPF to be packaged.

During the pilot phase, the samples from HQCP were tested and the results are displayed in Table 1.

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TABLE 1: LABORATORY RESULTS

Quality Parameter	HQCPF	CPRV
Dry matter [%]	89.4	87.5 ± 11.6
Ash [%]	5.75	5.5 ± 4.3
Ether Extract [%]	0	1.8 ± 3.3
Crude Protein [%]	5.42	5.3 ± 2.5
Fat [%]	0.5	1.2 ± 0.5
Fiber [%]	6.97	14.3 ± 9.9
HCN [mg/kg]	3.6	5.4 ± 2.7
Aflatoxin HQCP [ppb]	2.4 ± 0.72	21.0 ± 1.7

Customers (farmers)

- Animal feed ingredients from cassava peels can replace maize that is more expensive.
- Cassava peels are more suitable in Rwanda and other places in Africa that suffer from shortage of affordable high-quality animal feed.
- In Rwanda, wet cake of cassava peels is fed to pigs.
- In Rwanda, HQCPF is fed to cattle, chicken and pig all types of livestock (pigs, cattle, poultry, fish, etc.).
- Sheep and goat farmers can also use the wet cake to feed their animals while fish farmers can use HQCPF.
- 481 farmers close to the processing unit supplied the cassava peels.
- 126 farmers bought cassava mash.
- 43 farmers bought HQCPF.

Start up requirements

- Identify reliable sources of cassava peels at local and district level to avoid huge transport costs.
- Identify livestock farmers and raise awareness about the advantage of animal feed production from cassava peeling wastes.
- Proceed to determine the processing capacity and identify the equipment setups.
- Develop and strengthen relationships with sources of cassava peels (cassava farmer organizations and individual farmers) and livestock farmers.
- Owning a cassava root processing unit that can supply 30% of the volume of cassava peels required would be an advantage.

Investment

The innovation requires investment in land, buildings, machinery, and working capital. Table 2 provides a summary of the minimum investment required and its profitability.

TABLE 2: INVESTMENT COST

Item (\$)	Amount (\$)
CAPEX	48,1710
Working Capital	1,234
NPV (5 years)	41,459
IIR	49.4%

The RUNRES project supported this pilot phase by providing matching-grant and technical assistance to AKA-NOZE. Table 3 shows the distribution of co-financing between the project and the company.

TABLE 3: CO-FINANCING

SDC (\$)	Akanoze (\$)
60,000	40,652

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References

- Project MEL sheet filled by stakeholders.
- MoU signed between by stakeholder and IITA
- Cassava Peels for Animal Feed Production: <https://propas.iita.org/en/solutions/cassava-peels-for-animal-feed-production/57/details/>

