INSTITUTE OF TECHNOLOGY OF CAMBODIA
RESEARCH AND INNOVATION CENTER

THE 14TH SCIENTIFIC DAY
June 5-6, 2025
Phnom Penh, Cambodia

RESEARCH AND INNOVATION CENTER

Poster ID
FTN090

Nutritional analysis of Cassava varieties KM325, KU50, Rayong4, Rayong72 and Rayong90 in Preah Vihear Province.

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Introduction

Cassava (Manihot esculenta Crantz) is a starchy root crop widely cultivated in tropical regions for its high carbohydrate content and resilience to poor soils and drought. It serves as a major food source for millions and is also used in animal feed and industrial products. Nutritional evaluation of cassava is essential to understand its value and potential in food security and product development. Cassava is a key agricultural commodity in Cambodia, ranking second only to rice in terms of production and consumption.The cassava sector in Cambodia offers significant opportunities for improving food security, rural livelihoods, and bioenergy development.

Objectives

To study the nutritional value in cassava that comes from Phear Vihear Province on the different varieties, such as KM325, KU50, Rayong 4, Rayong 72 and Rayong 90, that are taken from 4 different farms, there are Am Poeun, Kong Kuy, Rus Ran farmer, and Sem Sokur. The parameters for analysis are ash, moisture, fat, protein, fiber, reducing sugar, and carbohydrates to find the best varieties for growing.

Methodology

Cassava samples were cleaned, peeled, and dried before being ground i nto a fine powder. Standard analytical procedures were used to determine th e nutritional composition:.

- **Mositure** — Measured by oven drying at 105°C until constant weight.
- **Ash** — Determined by incinerating the sample in a muffle furnace at 550°C.
- **Fat** — Extracted using a Soxhlet apparatus with petroleum ether as the solvent.
- **Fiber** — Measured by sequential acid and alkaline digestion followed by incineration.
- **Protein** — Analyzed using the Kjeldahl method (conversion factor 6.25).
- **Reducing sugar** — Determine the reducing sugar content in a sample through titration, based on the principle that reducing sugars reduce Fehling's solution.
- **Carbohydrates** — Estimated by difference: 100% - (M% + A% + Fa% + F% + P%).

Results

Table 1. Nutritional value of four differences farm in Phear Vinhea

Parameter	%M	%A	%Fa	%F	%P	%S	%C
KM325^{A}	9.05	2.05	0.46	2.17	1.69	2.59	86.72
KU50^{A}	8.99	1.98	0.61	2.34	2.15	2.56	86.26
RY4^{A}	7.54	1.76	0.71	2.05	2.38	2.51	87.58
RY72^{A}	9.18	2.17	0.60	1.89	1.84	2.69	86.19
RY90^{A}	7.62	1.71	0.72	2.49	2.14	2.57	87.79
KM325^{K}	8.59	1.48	0.44	2.05	1.92	2.51	87.69
KU50^{K}	8.41	0.87	0.76	2.19	1.96	2.56	88.04
RY4^{K}	8.66	0.91	0.36	2.65	1.96	2.46	88.09
RY72^{K}	8.60	1.33	0.71	2.32	2.35	2.59	86.99
RY90^{K}	8.83	1.00	0.58	2.02	1.60	2.55	87.97
KM325^{R}	8.88	1.92	0.81	1.85	2.51	2.62	84.72
KU50^{R}	8.62	1.71	1.12	1.80	2.31	2.70	85.55
RY4^{R}	8.51	1.60	0.58	0.94	3.20	2.79	85.05
RY72^{R}	7.35	1.48	0.45	2.03	3.34	2.52	86.48
RY90^{R}	8.66	0.75	2.11	1.67	2.53	2.66	83.90
KM325^{S}	9.17	2.23	0.71	1.95	0.94	2.61	86.92
KU50^{S}	9.01	1.93	0.57	1.57	1.00	2.57	87.46
RY4^{S}	9.70	1.35	0.82	2.18	0.78	2.51	87.34
RY72^{S}	9.30	1.71	0.20	1.79	1.17	2.64	87.74
RY90^{S}	8.97	1.53	0.50	1.93	1.23	2.56	87.74

Moisture content ranged from 7.35% to 9.70%, with lower levels indicating better suitability for storage and processing. Ash content varied from 0.75% to 2.23%, reflecting differences in mineral content, with KM325^{S} showing the highest value. Fat levels were generally low (0.20%-2.11%), consistent with cassava's natural profile. Fiber content ranged from 1.57% to 2.49%, with RY90^{A} has the higest fiber content. Protein content in cassava is ranged from 0.78% to 3.34%, with RY4^{R} has the highest protein. Reducing sugars were stable (2.46%-2.79%), supporting cassava's use in fermentation and food processing. Carbohydrate content, cassava's primary nutritional feature, was high across all sample (83.90%-88.09%), confirming its value as a major energy source.

Conclusion

The nutritional profiles of cassava varieties are influenced by both genetics and environment. Varieties like RY72^{R}, with higher protein and fiber, are ideal for industrial and nutritional use, while km325^{S} and KM325^{A} offer better mineral content. Stable sugar levels support fermentation applications, and high carbohydrates across all types confirm cassava's value as an energy source. Selecting varieties based on specific traits can enhance food security, health, and industrial processing.

ASEET Project (2020-2025)
Agroecology and Safe Food System Transitions
AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

Funding organization
Co-funded by the European Union
FFEM FONDS FRANÇAIS POUR L'ENVIRONNEMENT MONDIAL

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