

Cacao and its Potential for Colon Cancer Prevention: Policy Opportunities Beyond Nutrition



S&T in Behavioral & Social Sciences

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Background

The impact of modern medicine, with different treatment modalities such as surgery, chemotherapy, and all other advanced therapies, sometimes presents great difficulties. Patients undergo severe side effects, and treatment options differ in their impact and effectiveness on different patients. These disquieting features underline a compelling reason to seek simply and potentially less harmful methods of avoiding or ameliorating cancer.

Globally, and right here at home, there's growing excitement about natural approaches to health. Many plant-based foods contain special compounds that can be beneficial. Cacao, the bean from which

chocolate is made, is one such example. It's rich in natural substances known for their antioxidant properties (meaning they protect our bodies from damage) and their ability to fight cancer cells.

Given the increasing number of colon cancer cases and the limitations of current treatments, it's vital for us in the Philippines to look into accessible and potentially safer options. Locally sourced cacao could offer a promising, natural path forward in our fight against this disease.

Research Objectives

This study explored the potential health benefits of UF-18 cacao powder. Specifically, the study:

- a. checked the powder's safety by making sure it doesn't contain harmful heavy metals;
- b. measured its antioxidant power to see how well it can protect the body's cells from damage; and
- c. tested its cancer-fighting ability to determine how effectively it can stop the growth of human colon cancer cells.

Methodology

1. Safety Profile Test

Goal: Ensure UF-18 cacao is safe for use

Method:

- Powder tested with X-ray Fluorescence (XRF)
- Identified and measured all elements, including heavy metals

Why it matters: Confirms cacao is free from dangerous levels of heavy metals

2. Antioxidant Power Test

Goal: Measure how well cacao fights harmful molecules

Test Used:

- DPPH Radical Scavenging Assay
- Determined how much cacao is needed to neutralize free radicals

Why it matters: Helps protect cells from damage caused by oxidative stress

3. Anticancer Activity Test

Goal: See how cacao affects colon cancer cells (HCT-116)

Test Used:

- Cancer cells grown in lab dishes
- Cacao powder applied in varied amounts
- Left for 72 hours
- Compared to Doxorubicin, a cancer drug
- Cell survival was measured

Why it matters: Shows potential for future cancer research

Key Findings

1. Safety & Mineral Composition

- **Low Cadmium Content:**
 - Only 0.48% - Well below safety thresholds
- **Rich in Essential Minerals:**
 - Potassium - 40.83%
 - Calcium - 33.11%
 - Iron - 10.46%
 - Phosphorus - 6.16%
 - Silicon - 4.55%
 - Trace amounts: Nickel, Manganese, Titanium

2. Antioxidant Activity

- DPPH Radical Scavenging Assay
- IC50 = 17.60 µg/mL
- Classified as a "Very Strong" Antioxidant
- Helps neutralize free radicals

3. Anticancer Potential

- MTT Assay vs. HCT-116 (Colorectal Cancer Cells)
- IC50 = 15.81 µg/mL
- Indicates Moderate to Strong Cytotoxic Activity

Conclusion

This study provides exciting evidence that UF-18 cacao powder from Lasam, Cagayan, Philippines is not only safe but also a powerful source of antioxidants and shows promising ability to fight colon cancer cells in lab tests.

These discoveries highlight the immense value of our own local cacao varieties as a natural resource that can improve both public health and our economy here in the Philippines.

To truly benefit from these promising results, it's crucial that we continue this research. Strong government policies and close teamwork among different agencies are essential to turn these laboratory findings into real health improvements for Filipinos and create lasting economic opportunities for our communities.

Policy Recommendations

Based on these compelling findings, the following key recommendations are propose:

- Promote local cacao's health benefits, including its antioxidant and anti-cancer properties, through public campaigns and support human clinical trials to confirm its effectiveness and safety.
- Invest in sustainable cultivation and product development for UF-18 cacao to boost its value and rural economies. Also, fund further research to identify the specific compounds responsible for its health benefits.
- Prioritize human clinical trials and interdisciplinary collaborations to fully understand cacao's therapeutic potential and optimal use.
- Establish clear regulations for cacao-derived health products to ensure their safety and effectiveness for consumers.

Target Policy Actors and Beneficiaries



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Editor's Note

This policy brief is based on results of the CSU-funded project "Cacao's flair against colorectal despair: Elemental analysis, in vitro antioxidant and anticancer property of UF-18, Theobroma cacao powder against human colorectal cancer cells (HCT-116 Cells)" This project was implemented by the Cagayan State University - Lasam Campus. The CSU - Lasam Campus project team is composed of Ronel T. Pacubat, PhD

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