

CARABAO-BASED BUSINESS PORTFOLIO

Series | Number 3



Department of Agriculture
PHILIPPINE CARABAO CENTER
CARABAO DIVISION OFFICE

AN INVESTMENT
OVERVIEW

VERMICAST

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VERMICAST PRODUCTION BUSINESS

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VERMICAST PRODUCTION BUSINESS

An Investment Overview

Monitoring and Business Planning Support Section
Planning and Information Management Division
DA-Philippine Carabao Center National Headquarters and Gene Pool

Publications in the "Carabao-Based Business Portfolio Series":

1. 5-Cow Start-up Dairy Buffalo Farm Business: An Investment Overview
2. 10-Cow Start-up Dairy Buffalo Farm Business: An Investment Overview
3. 15-Cow Start-up Dairy Buffalo Farm Business: An Investment Overview
4. 20-Cow Start-up Dairy Buffalo Farm Business: An Investment Overview
5. 25-Cow Start-up Dairy Buffalo Farm Business: An Investment Overview
6. 50-Cow Start-up Dairy Buffalo Farm Business: An Investment Overview
7. Corn Silage Production Business: An Investment Overview
8. Vermicast Production Business: An Investment Overview
9. Small-Scale Dairy Processing Facility Business: An Investment Overview
10. Dairy Box One-Stop Shop Business: An Investment Overview
11. Kardeli Meat Products Retail Business: An Investment Overview

VERMICAST PRODUCTION BUSINESS

An Investment Overview



FOREWORD

The current national landscape defines the Philippines as undergoing challenges because of economic shocks and market instability as consequences of the recent pandemic, international disputes, and natural calamities. The goal is to recover as soon as possible, strategically refocus in time of the new leadership, and continue with our allegiance to the global Sustainable Development Goals. The Department of Agriculture (DA) is vital in the attainment of the president's 8-point economic agenda, particularly those concerning food security, job creation, and investment flow to the agriculture sector – all towards reduced vulnerability, hunger, and poverty.

Attached to the DA, the DA-Philippine Carabao Center is mandated through RA 7307 to conserve, propagate, and promote the carabao as a source of milk, meat, draft power, and hide. Since its creation in 1992, the agency has established its credibility as a premiere research and development institution serving as the lead agency for livestock and biotechnology research pursuant to DA AO no. 9 s. 2008, and just recently, as the National Livestock Cryobank for the department. DA-PCC have become a vital cog in the livestock industry working closely with various international and local funding institutions, national legislators, private organizations, LGUs, and all the other players across the carabao value chain towards increasing productivity, championing innovations, and proving the economic viability of carabao-based businesses.

With the reception of the 2018 released prototype publication of DA-PCC's Carabao-Based Business Portfolio Series featuring the investment requirement and financial viability of 6 Dairy Buffalo Businesses, to wit:

- (1) 5-Cow Start-up Dairy Buffalo Farm Business,**
- (2) 10-Cow Start-up Dairy Buffalo Farm Business,**
- (3) 15-Cow Start-up Dairy Buffalo Farm Business,**
- (4) 20-Cow Start-up Dairy Buffalo Farm Business,**
- (5) Silage Production, and**
- (6) Dairy Box One-Stop Shop.**



This official publication of investment guide is hereby issued to update the technical and economic assumptions given the innovations and the price changes of late. Additional businesses will also be introduced, and opportunities were divided in categories making the final portfolio that will be released in 2024 to 2027 consisting of the final investment modules as follows:

A. Dairy Value Chain

- 5-Cow Start-up Dairy Buffalo Farm Business
- 10-Cow Start-up Dairy Buffalo Farm Business
- 15-Cow Start-up Dairy Buffalo Farm Business
- 20-Cow Start-up Dairy Buffalo Farm Business
- 25-Cow Start-up Dairy Buffalo Farm Business
- 50-Cow Start-up Dairy Buffalo Farm Business
- Small-scale Dairy Processing Facility Business
- Dairy Box One-Stop-Shop Business

B. Meat Value Chain

- 5 Carabao Fattening Business
- 10 Carabao Fattening Business
- Kardeli Meat Products Retail Business

C. Dairy and Meat Value Chain Inputs

- Vermicast Production Business
- Corn Silage Production Business
- Individual/Group AI Business
- Semen Straw Production Business

These publications are designed to guide potential investors as they consider venturing in the carabao value chain. Information on what crucial factors and events should and should not happen to earn profits in the long run are all included in the assumptions formulated after a series of consultation with DA-PCC technical experts, farmers, and other value chain players in the field.

With the effects of the National Feeding Program pursuant to RA 11037 also known as the “Masustansiyang Pagkain Para sa Batang Pilipino Act”, and the Carabao-based Business Improvement Network (CBIN) and Coconut-Carabao Development Project (CCDP) championed by Sen. Cynthia A. Villar, the carabao sector has gained much stability that it thrived even during the pandemic. These factors, along with DA-PCC’s brand of research, business, technical, market, and extension services provision

make the carabao value chain a promising investment opportunity. This portfolio conveys DA-PCC’s honest commitment to stimulating investment not just for the carabao sector but also for the agriculture sector in general. These business modules were just some of the tools that DA-PCC had developed to ensure a more private-led and thriving carabao value chain.

Mabuhay ang sektor ng Kalabawan!



DR. LIZA C. BATTAD
Executive Director



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INTRODUCTION

We present to you the Vermicast Production Business as derived from the Dairy and Meat Value Chain Inputs segment of the Carabao Value Chain with an initial investment requirement of PHP821,287.14 and project to earn an Internal Rate of Return of 40.04% with a payback period of 3.81 years.

Like each investment opportunity presented in the series, we begin with a set of assumptions from the technical, economic, and market aspect of the business. This section must be read thoroughly specially for interested investors with little to no background in the investment opportunity at hand. This is followed by a conceptual discussion of selected investment worthiness indicators i.e. Net Present Value, Hurdle Rate, Internal Rate of Return, Payback Period, Profitability Index, and Initial Investment requirement. A dedicated page showing the Summary of Profitability Indicators follows showing the numerical merits of the opportunity.

Details of the 10-year analysis follow starting with the projected Income Statement which shows the annual Revenues, Expenses, Net Income, and ROI. Supporting notes for specific revenues and expense items were provided afterward to show how the amounts were computed. Projected Cash Flows were then shown from which the investment worthiness indicators were generated. Finally, for the quantitative parts, the breakdown of the initial investment requirement was also provided with details as may be necessary.

Succeeding pages contain other vital information to wit:

(1) Profitability Indicators, Summary of All Business Modules in the Portfolio, (2) Testimonial from actual adopters, (3) List of available DA-PCC technologies and contact information, (4) Inventory of best practices, (5) Glossary of terms, (6) Authors and other contact information, and (7) Pool of Technical Experts.





VERMICAST PRODUCTION ASSUMPTIONS

MANURE MATTERS!

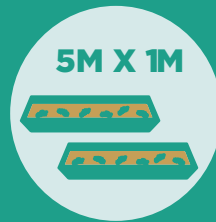
Vermicomposting is an environment-friendly, effective, and efficient way of converting waste or manure into valuable and useful products. It uses earthworms that process the biodegradable materials into soil conditioner and organic fertilizer.

The PHP821,287.14 investment sets up two (2) vermicomposting beds with a dimension of 5 m by 1 m and a storage area. This venture has a payback period of 3.81 years and is projected to gain internal rate of return of 37% and have a net present value of PHP1,289,698.20 in 10 years.

To visualize a financial flow of sets of annual revenues, expenses, income and returns encompassing a 10-year operating period, we hold the following set of assumptions that guided all the dairy farming models' profitability calculations.

ASSUMPTIONS REVENUES

THE FOLLOWING ASSUMPTIONS WERE BASED ON
DA-PCC NATIONAL GENEPOOL EXPERIENCES AS FOLLOWS:



There are 2 vermicomposting
beds with a dimension of 5M x 1M.



Each bed has an output of 50kg
of vermicast, which can be sold
at PHP400.00 pesos per sack.



Each bed can be harvested in
30 days or 1 month.

ASSUMPTIONS EXPENSES

THE FOLLOWING ASSUMPTIONS WERE BASED ON
DA-PCC NATIONAL GENEPOOL EXPERIENCES AS FOLLOWS:

P50/SACKS



Cost of manure is PHP50.00
per sack

P600/Kg



Worms are bought at
PHP600.00 per kilo.

Good for 30Days
1 Bed = 100kg Worms



Each bed is composed of
3,000 kg of manure with 1 kg
of worms good for 30 days.

1%

1% of the worms are expensed
as an effect of feeding efficiency
caused by different generations of
worms in each cycle.

P430
/Day



Direct labor is based on 1
employee with an average daily
wage of PHP430.00 covering
360 workdays per year.

ASSUMPTIONS NET INCOME AND RETURN ON INVESTMENT



Annual return on investment is computed by dividing accrual net income by total accrual expenses

$$ROI = \left(\frac{\text{ACCRUAL NET INCOME}}{\text{ACCRUAL NET EXPENSES}} \right) \times 100$$



Annual net income is computed by deducting the total expenses from the total revenues under accrual accounting method.

$$\text{ANNUAL NET INCOME} = \text{TOTAL REVENUES} - \text{TOTAL EXPENSES}$$

INVESTMENT-WORTHINESS INDICATORS

For identifying the investment worthiness of this portfolio, following indicators were computed as follows:

Net Present Value of Cash Flows is computed by discounting annual cash flows using a hurdle rate of 14%

Hurdle Rate is the minimum rate that a company expects to earn when investing in a project. Hence the hurdle rate is also referred to as the company's required rate of return or target rate. In order for a project or business venture to be accepted, its internal rate of return must exceed the hurdle rate.

Here, the hurdle rate is assumed to be 14%. Hence, the portfolio must carry an Internal Rate of Return higher than 14% or else, the investment will have to be rejected.^[1]

Internal Rate of Return (IRR) is a metric used in evaluating investment options to estimate the profitability of potential investments. IRR may be understood as the rate of growth a project or business is expected to generate access a specified time frame.

For this investment portfolio, IRR is also estimated and compared vis-à-vis the set hurdle rate of 14%. The IRR should be greater than 14% to become investment-worthy.^[2]

Payback Period is the time at which all initial investments will be recuperated. An investment portfolio of this type should return a Payback Period of at most 6 to 7 years. With this, it is imperative to note that Vermicast Production Business is for committed businessmen only.

Profitability Index. All annual Net Cash Inflows (disregarding the initial investment) are discounted using the hurdle rate of 14% for indexing purposes with the amount of Initial Investment. This is actually the model used for ranking different investment portfolios. As a general rule, the profitability index should be greater than 1.

Initial Investment is the summation of the estimated capital investment requirement (i.e. property, plant, and equipment, working capital).

[1] Averkamp, Harold (CPA, MBA. What is hurdle rate?. Accounting Coach, 2018. <https://www.accountingcoach.com/blog/what-is-hurdle-rate>. March 7, 2018
[2] Internal Rate of Return – IRR. Investopedia, 2018. <https://www.investopedia.com/terms/i/irr.asp>. March 7, 2018

VERMICAST PRODUCTION BUSINESS

SUMMARY OF PROFITABILITY INDICATORS

BASED ON ZERO-DEBT 10-YEAR PROJECTION

Initial Investment

PHP821,287.14

Payback Period

3.81 Years

Monthly Net Income

PHP19,666.11

Net Present Value (NPV)

PHP703,700.97

Total Monthly Revenue

PHP45,855.52

Internal Rate of Return

40.04%

Total Monthly Cost

PHP26,189.41

VS

Bank Time Deposit 5-6%
Equity Security in Financial Market 10-14%
Treasury Bills (Phil.) 6%

TRIVIA

The earthworm species *Eisenia fetida*, commonly known as red wigglers, are widely used in vermicomposting due to their voracious appetite for organic waste and their ability to thrive in confined spaces.

Edwards, C.A. (1998)

INTRODUCTION TO
**FINANCIAL
STATEMENTS**



REVENUE FORECAST PROJECTED INCOME STATEMENT

CASE 1: ZERO DEBT

	YEAR 1	YEAR 2	YEAR 3	YEAR 4
REVENUES				
Sales	480,000.00	494,400.00	509,232.00	524,508.96
EXPENSES				
Total Direct Material	99,668.57	99,668.57	99,668.57	104,652.00
Direct Labor	154,800.00	154,800.00	154,800.00	162,540.00
Total Overhead Expenses	35,592.86	35,592.86	35,592.86	37,372.50
Total Selling and Admin Expenses	6,000.00	6,000.00	6,000.00	6,300.00
Total Expenses	296,061.43	296,061.43	296,061.43	310,864.50
Farm Net Income/Net Loss	183,938.57	198,338.57	213,170.57	213,644.46
ROI*	62.13%	66.99%	72.00%	68.73%

**For the purpose of continually computing the ROI after the initial investment, the total expenses will be considered as the annual "investment". The new formula of the annual ROI will be: Net Income divided by Total expenses. This is with the assumption that annual total expenses are considered investments in the business.*



NT (PHP)

YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
540,244.23	556,451.56	573,145.10	590,339.46	608,049.64	626,291.13
104,652.00	104,652.00	109,884.60	109,884.60	109,884.60	115,378.83
162,540.00	162,540.00	170,667.00	170,667.00	170,667.00	179,200.35
37,372.50	37,372.50	39,241.13	39,241.13	39,241.13	41,203.18
6,300.00	6,300.00	6,615.00	6,615.00	6,615.00	6,945.75
310,864.50	310,864.50	326,407.73	326,407.73	326,407.73	342,728.11
229,379.73	245,587.06	246,737.38	263,931.73	281,641.91	283,563.02
73.79%	79.00%	75.59%	80.86%	86.29%	82.74%



REVENUE FORECAST PROJECTED INCOME STATEMENT

CASE 2: 70% DEBT

	YEAR 1	YEAR 2	YEAR 3	YEAR 4
REVENUES				
Sales	480,000.00	494,400.00	509,232.00	524,508.96
EXPENSES				
Total Direct Material	99,668.57	99,668.57	99,668.57	104,652.00
Direct Labor	154,800.00	154,800.00	154,800.00	162,540.00
Total Overhead Expenses	35,592.86	35,592.86	35,592.86	37,372.50
Total Selling and Admin Expenses	6,000.00	6,000.00	6,000.00	6,300.00
Total Expense	296,061.43	296,061.43	296,061.43	310,864.50
Farm Net Income/Net Loss	183,938.57	198,338.57	213,170.57	213,644.46
Less: Interest Expense*	86,235.15	68,988.12	51,741.09	34,494.06
Earnings after Interest	114,950.45	143,148.08	171,777.70	186,049.21
ROI**	31.49%	40.75%	50.90%	54.97%

*Interests are computed at 15% annual rate

**For the purpose of continually computing the ROI after the initial investment, the total expenses will be considered as the annual "investment". The new formula of the annual ROI will be: Net Income divided by Total expenses. This is with the assumption that annual total expenses are considered investments in the business.



NT (PHP)

YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
540,244.23	556,451.56	573,145.10	590,339.46	608,049.64	626,291.13
104,652.00	104,652.00	109,884.60	109,884.60	109,884.60	115,378.83
162,540.00	162,540.00	170,667.00	170,667.00	170,667.00	179,200.35
37,372.50	37,372.50	39,241.13	39,241.13	39,241.13	41,203.18
6,300.00	6,300.00	6,615.00	6,615.00	6,615.00	6,945.75
310,864.50	310,864.50	326,407.73	326,407.73	326,407.73	342,728.11
229,379.73	245,587.06	246,737.38	263,931.73	281,641.91	283,563.02
17,247.03					
215,582.10	245,587.06	246,737.38	263,931.73	281,641.91	283,563.02
66.40%	79.00%	75.59%	80.86%	86.29%	82.74%



REVENUE FORECAST PROJECTED INCOME STATEMENT

CASE 3: 60% DEBT

	YEAR 1	YEAR 2	YEAR 3	YEAR 4
REVENUES				
Sales	480,000.00	494,400.00	509,232.00	524,508.96
EXPENSES				
Total Direct Material	99,668.57	99,668.57	99,668.57	104,652.00
Direct Labor	154,800.00	154,800.00	154,800.00	162,540.00
Total Overhead Expenses	35,592.86	35,592.86	35,592.86	37,372.50
Total Selling and Admin Expenses	6,000.00	6,000.00	6,000.00	6,300.00
Total Expense	296,061.43	296,061.43	296,061.43	310,864.50
Farm Net Income/Net Loss	183,938.57	198,338.57	213,170.57	213,644.46
Less: Interest Expense*	73,915.84	59,132.67	44,349.51	29,566.34
Earnings after Interest	124,805.90	151,032.43	177,690.97	189,991.39
ROI**	35.14%	43.99%	53.60%	56.80%

*Interests are computed at 15% annual rate

**For the purpose of continually computing the ROI after the initial investment, the total expenses will be considered as the annual "investment". The new formula of the annual ROI will be: Net Income divided by Total expenses. This is with the assumption that annual total expenses are considered investments in the business.



NT (PHP)

YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
540,244.23	556,451.56	573,145.10	590,339.46	608,049.64	626,291.13
104,652.00	104,652.00	109,884.60	109,884.60	109,884.60	115,378.83
162,540.00	162,540.00	170,667.00	170,667.00	170,667.00	179,200.35
37,372.50	37,372.50	39,241.13	39,241.13	39,241.13	41,203.18
6,300.00	6,300.00	6,615.00	6,615.00	6,615.00	6,945.75
310,864.50	310,864.50	326,407.73	326,407.73	326,407.73	342,728.11
229,379.73	245,587.06	246,737.38	263,931.73	281,641.91	283,563.02
14,783.17					
217,553.19	245,587.06	246,737.38	263,931.73	281,641.91	283,563.02
67.42%	79.00%	75.59%	80.86%	86.29%	82.74%



REVENUE FORECAST PROJECTED INCOME STATEMENT

CASE 4: 50% DEBT

	YEAR 1	YEAR 2	YEAR 3	YEAR 4
REVENUES				
Sales	480,000.00	494,400.00	509,232.00	524,508.96
EXPENSES				
Total Direct Material	99,668.57	99,668.57	99,668.57	104,652.00
Direct Labor	154,800.00	154,800.00	154,800.00	162,540.00
Total Overhead Expenses	35,592.86	35,592.86	35,592.86	37,372.50
Total Selling and Admin Expenses	6,000.00	6,000.00	6,000.00	6,300.00
Total Expense	296,061.43	296,061.43	296,061.43	310,864.50
Farm Net Income/Net Loss	183,938.57	198,338.57	213,170.57	213,644.46
Less: Interest Expense*	61,596.54	49,277.23	36,957.92	24,638.61
Earnings after Interest	134,661.34	158,916.79	183,604.23	193,933.57
ROI**	38.99%	47.37%	56.38%	58.67%

*Interests are computed at 15% annual rate

**For the purpose of continually computing the ROI after the initial investment, the total expenses will be considered as the annual "investment". The new formula of the annual ROI will be: Net Income divided by Total expenses. This is with the assumption that annual total expenses are considered investments in the business.



NT (PHP)

YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
540,244.23	556,451.56	573,145.10	590,339.46	608,049.64	626,291.13
104,652.00	104,652.00	109,884.60	109,884.60	109,884.60	115,378.83
162,540.00	162,540.00	170,667.00	170,667.00	170,667.00	179,200.35
37,372.50	37,372.50	39,241.13	39,241.13	39,241.13	41,203.18
6,300.00	6,300.00	6,615.00	6,615.00	6,615.00	6,945.75
310,864.50	310,864.50	326,407.73	326,407.73	326,407.73	342,728.11
229,379.73	245,587.06	246,737.38	263,931.73	281,641.91	283,563.02
12,319.31					
219,524.28	245,587.06	246,737.38	263,931.73	281,641.91	283,563.02
68.45%	79.00%	75.59%	80.86%	86.29%	82.74%



PROJECTED CASHFLOW

ASSUMPTIONS

Hurdle Rate
used for Discounting Purposes
14%

Working Capital
PHP281,987.14

Capital Investment
PHP539,300.00

Total Initial Investment
PHP821,287.14

CASHFLOWS (IN PHP)

CASE 1 ZERO DEBT

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9
198,012.86	212,412.86	227,244.86	227,718.75	243,454.01	259,661.34	260,811.66	278,006.02	295,716.20

CASE 2 70% DEBT

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9
(54,943.58)	(12,948.33)	29,478.91	57,548.05	100,878.57	259,661.34	260,811.66	278,006.02	295,716.20

CASE 3 60% DEBT

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9
(18,806.95)	19,246.12	57,731.19	81,858.15	121,246.49	259,661.34	260,811.66	278,006.02	295,716.20

CASE 4 50% DEBT

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9
17,329.69	51,440.58	85,983.47	106,168.25	141,614.41	259,661.34	260,811.66	278,006.02	295,716.20

TRIVIA

The process of vermicomposting can increase the soil's ability to retain water, making it more resistant to drought. This is due to the increased organic matter and microbial activity in the soil.
(Source: Cornell Waste Management Institute)

2 of 2


	Present Value of Cash Flows	NPV	IRR	Payback Period (Years)	Profitability Index
YEAR 10 297,637.30	1,243,000.97	703,700.97	40.04%	3.81	2.30
YEAR 10 297,637.30	539,410.92	110.92	14.00%	7.65	1.00
YEAR 10 297,637.30	639,923.79	100,623.79	16.84%	7.14	1.19
YEAR 10 297,637.30	740,436.65	201,136.65	19.95%	6.61	1.37


POOL OF TECHNICAL EXPERTS

Equally important as investing in superior breeding stocks and optimal equipment and other physical properties are capitalizing on the know-how and technical knowledge in dairy farming. The team of experts and extension workers of the DA-Philippine Carabao Center shall provide for your needs on practical expertise. Listed below are the DA-PCC units to provide an array of support for your dairy farm start-up:

Dairy Herd Acquisition	Operations Group	Edwin C. Atabay Scientist II Head, Operations
Farm Management and Veterinary Support Services	National Dairy Business Hub (NDBH)	Cyril P. Baltazar Farm Superintendent II NDBH Coordinator
Feeding Management/ Forage Management	Production Systems and Nutrition Section (PSNS) /Gene Pool	Mary Rose D. Uy-De Guia Senior Science Research Specialist Head, PSNS Lawrence P. Belotindos Science Research Specialist I Head, Gene Pool
Breeding/Artificial Insemination	Animal Breeding and Genomics Section (ABGS)/ Reproduction and Physiology Section (RPS)	Ester B. Flores Scientist I Head, ABGS Excel Rio S. Maylem Senior Science Research Specialist Head, RPS
Dairy Business Feasibility/ Operational and Financial Status Check	Monitoring and Business Planning Support Section (MBPSS)	Pauline A. Maramag Project Evaluation Officer II Head, MBPSS
Milk Handling/Milk Processing/Trade and Marketing	Carabao Enterprise Development Section (CEDS) Product Development and Innovation Unit Processing and Marketing Unit (PMU)	Patrizia Camille O. Saturno Science Research Specialist II Head, CEDS Teresita M. Baltazar Science Research Specialist I Head, PDIU Marivic A. Orge Project Development Officer II Manager, CDCPF Jeraldin S. Torres Marketing Manager Manager, Milka Krem Outlet
Information on Training and other Services Provided by DA-PCC	Knowledge Management Division	Khrizie Evert M. Padre Information Officer II Head, Learning Events Coordination Section

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TRIVIA

Vermicompost can contain five times more nitrogen, seven times more phosphorus, and 11 times more potassium than traditional compost. This makes it a highly nutrient-rich fertilizer for plants.
(Source: PennState Extension)

3 of 3



COOP
PHILIPPINES

TESTIMONIAL

“Syempre mayroon kaming farm, may mga waste at manure naman kami kaya nang binigyan kami ng DA-PCC at Ubay ng worms ay pinasok namin ang vermicomposting. Malaki ang naitulong ng DA-PCC, di lang sa vermi kundi pati sa pagkakalabaw namin.

Sila nagbigay ng worms namin, mga milking can para sa farmers, plant materials, mga technical at milking machine. Malaki ang naitulong sa amin ng business namin, nagkaroon kami ng job employment, nakatulong din kami sa mga bata sa milk feeding at pati na rin sa mga mahilig magtanim dahil ginagamit nila yung fertilizer namin.

“Since we operate a farm and generate waste and manure, we entered into vermicomposting when DA-PCC at Ubay gave us worms. DA-PCC helps us a lot, not only with vermicasting but also with our carabao business.

They gave us worms, milking cans for farmers, plant materials, technical know-how, and milking machines. Our business has helped us a lot. We had employment, we help children with the milk feeding program, and also those who love planting through using our fertilizer.”

MARIO BAROTO

Owner, Vermicast Production Business Module
Pinamungajan, Cebu

PROFITABILITY OF ALL MODULES IN

MODULE	Initial Investment (PHP)	Daily/Per cycle Net Income (PHP)
5-Cow Start-up Dairy Buffalo Farm Business	779,018.58	1,407.04
10-Cow Start-up Dairy Buffalo Farm Business	1,935,910.16	2,837.33
15-Cow Start-up Dairy Buffalo Farm Business	2,314,177.54	4,692.60
20-Cow Start-up Dairy Buffalo Farm Business	3,008,600.32	3,117.00
25-Cow Start-up Dairy Buffalo Farm Business	3,634,407.00	4,227.93
50-Cow Start-up Dairy Buffalo Farm Business	7,153,355.56	12,919.26
Small-scale Dairy Processing Facility Business	7,441,992.87	3,599.22
Kardeli Meat Products Retail Business	870,910.05	1,324.64
Dairy Box One-Stop Shop Business	1,466,500.00	2,116.51
Vermicast Production Business	821,287.14	19,666.11 (Monthly)
Corn Silage Production Business	1,274,000.00	125,347.88 (Per Cycle)

INDICATORS THE PORTFOLIO

NPV (PHP)	IRR (%)	Payback Period (years)	Profitability Index
890,034.65	28.57%	5.26	2.40
1,424,462.57	23.94%	6.08	1.88
3,442,615.76	32.52%	4.78	2.85
158,033.27	14.86%	7.10	1.07
460,745.64	15.98%	7.14	1.16
8,236,572.28	28.68%	5.14	2.45
1,864,074.24	22.47%	4.53	1.33
1,872,655.37	102.47%	2.13	5.68
2,478,155.15	51.67%	4.86	5.24
703,700.97	40.04%	3.81	2.30
1,289,698.20	37.35%	2.98	2.12

DA-PCC

available technology



Blockmate is a legume-based strategic feed supplement for ruminants as a source of protein, energy, and minerals. Using Blockmate increases the feed intake digestibility and increases the weight gain and growth of the animals. It also increases the growth of microbes in the rumen, which is the key to increasing milk production.

Buro Booster is a silage inoculant for corn, sorghum, and grass that enhances the production of lactic acid that is used for preservation. It minimizes undesirable yeast and mold growth and prevents spoilage. Buro Booster also improves the fermentation quality and nutritive value of the silage and shortens the duration of silage fermentation to 14 days, which is normally 21 days.



gies



Verisire is the Philippines' first Microsatellite-based technology parentage testing service for cattle and buffaloes. Through this, the sire identity is objectively verified or known, breeding animals can be chosen based on genetic worth, and animals can be easily traced in the breed registry. Superior animals can be properly valued because of the true parentage validated.



Enhanced Rice Straw (e-RS) is a ruminant feed treated with urea and molasses with an improved nutritive value. It has a 4% higher crude protein (CP), 14.2% and 7% increase in crude protein and dry matter digestibility, respectively, compared to plain rice straw. It is also an environmentally responsible technology as it lowers greenhouse gas emissions and carbon footprint.



INVENTORY OF BEST PRACTICE

VERMICAST PRODUCTION

- 1 Follows the policies and guidelines to organize the manure of carabao**
Sinusunod ang mga patakaran at panuntunan sa pagsasa-ayos ng dumi ng kalabaw
- 2 Ensures that the pile of manure of carabao is far from the households, animal barn, milk area and any form of water (stream, river, irrigation)**
Sinisiguradong ang tambakan ng dumi ng kalabaw ay malayo sa mga kabahayan, sa kulungan ng kalabaw, sa lugar ng gatasan at sa ano mang anyong tubig (sapa, ilog, irrigasyon)
- 3 The manure of carabao is decomposed before being used in Vermicomposting or before being fed to worms**
Pinapabulok muna ang dumi ng kalabaw bago gamitin sa Vermicomposting o bago ipakain sa mga alagang bulate
- 4 Ensures that the substrate is watered daily and that its temperature reaches 60 degrees celcius throughout the decomposition process to prevent weeds from growing in the manure**
Dinidiligang araw-araw at sinisiguradong umabot sa 60 degree celcius ang temperatura ng substrate habang pinapabulok upang mamatay ang ano mang buho ng mga damo na nakahalo sa dumi
- 5 Cool the substrate before putting it on vermibed or before feeding it on the worms**
Pinapalamig ang substrate bago ito ilagay sa vermibed o bago ipakain sa bulate
- 6 The worm is suited to the vermicomposting process: African Night Crawler or California Red Earthworm**
Ang alagang bulate ay angkop sa proseso ng vermicomposting: African Night Crawler or California Red Earthworm
- 7 The vermicomposting area is shaded, not flooded, has a nearby water source, and is close to the waste storage**
Ang lugar ng vermicomposting ay malilim, hindi binabaha, may malapit na magkukunan ng tubig at malapit sa imbakan ng dumi



- 8** **There is a vermibed that is suitable for the amount of manure produced and aligned with the rapid harvest of vermicat and worms**
May vermibed na angkop sa dami ng dumi ng kalabaw na napo-produce at nakaayon sa mabilis na paghaharvest ng vermicat at bulate
- 9** **Ensures that the food given is sufficient for the amount of worms in the vermibed (the 1 kg worm can consume 1kg substrate within one (1) day)**
Sinisigurado na ang ibinibigay na pagkain ay sapat sa dami ng bulate sa vermibed (ang 1 kg na bulate ay kayang umubos ng 1kg na substrate sa loob ng isang (1) araw)
- 10** **Ensures that the vermibed has no infiltration of other living things who can eat or kill worms**
Ang vermibed ay hindi napupuntahan ng ano mang buhay na maaring kumain o pumatay sa mga bulate
- 11** **Ensures that the vermibed is watered daily or if necessary to maintain the 60% moisture content of the substrate**
Dinidiligang ang vermibed araw-araw o kung kinakailangan upang mapapanaliti ang 60% moisture content ng substrate
- 12** **Worms are separated worms by migration before harvesting the vermicast**
Ihinihiwalay muna ang mga bulate sa pamamagitan ng migration bago anihin ang vermicast
- 13** **The vermicast's moisture is reduced by 30% before it is filtered**
Pinapababa ng 30% ang moisture ng aanihing vermicast bago ito salandrahin
- 14** **The vermicast is placed in a suitable place and ensures it will not dry**
Inilalagay sa angkop na lagayan ang inaning vermicast at sinisigurado na ito ay hindi matutuyo

GLOSSARY

BUSINESS TERMS

- Annual Net Cash Flow** refers to the difference between cash inflows and outflows of the business in a year.
- Capital Investment** refers to money invested in a business with the understanding that the money will be used to purchase fixed assets, rather than used to cover the business's day-to-day operating expenses.
- Direct Labor** includes the salaries paid and other benefits such as meals and bonuses provided for farm workers.
- Direct Material** includes feeds, forages, legumes, vitamins, and supplements which are directly involved in maintaining each animal.
- Earnings after Interest** refers to the income derived from the investment after deducting the interest expense of the credit financing.
- Farm Net Income/Loss or Net Income/Loss** is the total return after deducting all expenses incurred during the period.
- Hurdle Rate** is the minimum rate of return on a project or investment required by a manager or investor. The hurdle rate denotes appropriate compensation for the level of risk present; riskier projects generally have higher hurdle rates than those that are deemed to be less risky.
- Inflation Rate** is the rate at which the general level of prices for goods and services is rising and, consequently, the purchasing power of currency is falling.
- Interest Expense** is a non-operating expense which represents interest payable on any borrowings – bonds, loans, convertible debt or lines of credit.
- Interest Payment** refers to the payment amount determined by the interest rate on an account.
- Interest Rate** is the amount charged, expressed as a percentage of principal, by a lender to a borrower for the use of assets.
- Internal Rate of Return (IRR)** is a metric used in capital budgeting measuring the profitability of potential investments. Internal rate of return is a discount rate that makes the net present value (NPV) of all cash flows from a particular project equal to zero.
- Loan Amortization Schedule** is used to determine loan amortization payments and the allocation of each payment to interest and principal.
- Meat Revenue** represents the amount received by selling the animals either for slaughter or for raising purposes.
- Net Present Value (NPV)** is the difference between the present value of cash inflows and the present value of cash outflows. NPV is used in capital budgeting to analyze the profitability of a projected investment or project. It is computed by discounting annual cash flow using a hurdle rate of 14%.
- Other Revenues** is maintained to account for the sale of various farm by-products like manure, used sacks, etc.
- Overhead Expense** are expenses related to maintaining the farm but are not classified as direct materials and direct labor.
- Payback Period** is the amount of time it takes for a project's cumulative net cash inflows to recoup the initial investment.
- Present Value of Cash flow** refers to the value today of a cash flow to be received at a specific date in the future, accounting for the opportunity to earn interest at a specified rate.
- Principal Payment** is a payment toward the amount of principal owed.
- Profitability Index** is capital budgeting tool, defined as the present value of a project's cash inflows divided by the absolute value of its initial cash outflow.

OF TERMS

Projected Cash Flow shows the expected amounts of money that will come into a business along with what will go out as expenses.

Projected Income Statement is a projection schedule that looks at the money the business will gain over a specific period, normally one year, minus anticipated expenses for that period.

Property, Plant and Equipment is a summation of all a company's purchases of property, manufacturing plants and pieces of equipment to that point in time, less any amortization.

Raw Milk Sales is the total milk revenue received from selling the milk produced by the cows.

Return on Investment is measure of a firm's overall effectiveness in using its assets to generate returns to common stockholders.

Selling and Admin Expense are costs incurred for marketing and distribution of the milk; managing and record keeping of the farm.

Total Expense covers all the expenses incurred to operate and maintain the farm. This includes Direct Material, Direct Labor, and Overhead.

Total Farm Revenues is the summation of all revenue items including milk, meat, manure, other revenue, and Unrealized Gain on Change in FV of Biological Assets. Total Initial Investment is the total amount required to start a business.

Unrealized Gain or Change in FV of Biological Asset is in compliance with Philippine Accounting Standards 41 titled Agriculture, the increase or decrease in total value of herd is estimated at year-end and is treated as other non-cash income.

Working Capital refers to the capital of a business that is used in its day-to-day trading operations, calculated as the current assets minus the current liabilities.

DAIRY BUFFALO FARM MANAGEMENT TERMS

Breedable Female is any mature female carabao that is ready for breeding.

Breeding Stocks is a group of carabao used for the purpose of planned breeding. This includes heifer and cow

Bull is a breeding male carabao aged 2 years old and above.

Calf is a young carabao of either sex and below 1 year of age.

Calving is the act of giving birth.

Calving Interval refers to the period of time between two successive calving. The shorter the calving interval, the higher is the reproductive efficiency of the farm. The ideal calving interval in a dairy buffalo farm is a minimum of 380 days and a maximum of 410 days. This is broken down into 320 days gestation period and 60-90 days service period.

Cow is a mature female carabao that has already given birth.

Gestation Period also known as gestation length. It is the duration from the time of fertilization until parturition (calving), which on the average is 320 days (310-330 days) and 312 days (295-320 days) for the swamp and dairy buffalo types, respectively.

Heifer is a female carabao aged 2 years and above that has not yet given birth.

Lactation Days also known as lactation period. Refers to the period of milk production and suckling. The latter condition is eliminated in dairy farms when the calf is immediately weaned from the dam right after calving. The average length of lactation in dairy buffaloes in DA-PCC herds is 265 days, which ranges from 200-359 days.

Parity refers to the number of times a dam has given birth.

Yearling is a young carabao of either sex and aged one-year-old to 2 years old.

ZADIESHAR G. SANCHEZ

Project Development Officer V

Chief, Planning and Information Management Division

Mr. Zadieshar G. Sanchez took his BS Accountancy degree from Central Luzon State University and became a Certified Public Accountant in 2012. He earned his master's degree in Agricultural Economics minor in Environmental Science at the University of the Philippines Los Baños in 2022. He entered DA-PCC in 2014 and assisted in the establishment of the newly created Business Development and Commercialization Unit under the Planning and Special Projects Division. He was tasked to develop various financial reporting systems, monitoring dashboards, and assisted in the creation of several business models and technology economic valuations which are now being used or adopted by the stakeholders. He also established the DA-PCC's Internal Audit Section in 2016 where internal controls were assessed and installed agency-wide to ensure assets are safeguarded, financial reports are accurate and reliable, laws are followed, managerial policies are complied with, and most importantly, to evaluate value-for-money by ensuring that operations are efficient, effective, economical, and ethical. He was the lead author of the prototype publication of the Carabao Business Portfolio. He also concurrently serves the agency as the OIC-Chief of the Administrative and Financial Management Division where systems, manuals, and new programs are being developed.

JAN CZARINA M. SALAS

Former Project Evaluation Officer III

Jan Czarina M. Salas worked as Project Evaluation Officer III under the Planning and Information Management Division of DA-PCC. She was part of the pioneering team of staff that launched the Business Development and Commercialization unit under the said division, which trailblazed the provision of business workshops, and the creation of business models, dashboards, and operations guidelines for cooperatives and dairy entrepreneurs. She spearheaded the implementation of the Dairy Box program strategy wherein cooperative operators are provided with marketing assistance to advocate standard operations and quality dairy buffalo products. She is currently studying Master's in Business Administration while also being an entrepreneur, and a professional illustrator and graphic designer.

JOSHUA G. VILLANUEVA

Accountant II

Joshua G. Villanueva used to work as Financial Analyst under the Business Development and Commercialization Unit of the DA-Philippine Carabao Center. He is a Certified Public Accountant and currently studying for his Master's in Business Administration at Central Luzon State University. He provided business financial analyses, created various business models, organized business training, developed monitoring dashboards, and gave business assistance to clients. He was the point person for the available government loan programs available for carabao industry players. He also worked as an accountant at Philippine Rice Research Institute. He now handles the monitoring and coordination of the 500-Million PL480 Project entitled "Intensified Community-based Dairy Enterprise Build-Up", develops performance-based budgeting of the agency, and collects data for the Carabao Industry Fact Sheet/Outlook. He was recently appointed as an Accountant II of DA-PCC.

ANGELIQUE ANLOCOTAN-OREJANA

Former Business Development Analyst

Ms. Angeliqe Anlocotan-Orejana is a graduate of BS in Business Administration major in Economics at Central Luzon State University and has units in Masters of Science in Economics from Polytechnic University of the Philippines prior moving to New Zealand in 2022. She worked as Business Development Analyst under the Planning and Information Management Division from 2016 to 2019. She was one of the brains of Business Development and Commercialization Unit who developed financial monitoring tools now coined as "Dashboards". She spearheaded the development of Strategic Performance Management System (SPMS) Dashboard, and she facilitated the implementation of 6 Value Chain Projects across the country. Currently, she is working as Operations Administrator of Alliance Group Limited in New Zealand, overseeing the export shipments of the company.

PROFILE

PAULINE A. MARAMAG

Project Evaluation Officer II Head, Monitoring and Business Planning Support Section

Ms. Pauline A. Maramag is a Certified Public Accountant since 2018 who took her BS in Accountancy degree at Central Luzon State University and is currently taking up her Master of Business Administration degree at the same university. She started as a Financial Analyst and was promoted to Science Research Specialist II in the Business Development and Commercialization Unit (now Monitoring and Business Planning Support Section) who is responsible for the regular audit and monitoring of the production and business dashboards of the clients and agency's national headquarters and 12 regional centers, crafting of business plans, financial projections, feasibility studies, and profitability analysis for investment portfolios and industry proposals, technology valuation for commercialization, and the writing and conduct of researches. She led the launching of the Youth Development Program to prepare the second liners in Carabao entrepreneurship. She currently leads the MBPSS with both agency performance monitoring and client business planning tasks and initiatives.

QUEENIE B. RUIZ

Science Research Specialist II

Queenie B. Ruiz obtained her Bachelor of Science in Accounting Technology from Central Luzon State University in 2015, and her Bachelor of Science in Accountancy from Dr. Gloria D. Lacson Foundation Colleges Inc. in 2017, the same year that she passed the CPA Licensure Exam. She previously held the position of branch head in a real estate corporation for almost four years, where she was in charge of overseeing the day-to-day operations of the company. She now worked as a Science Research Specialist II at the Monitoring and Business Planning Support Section, where her responsibilities include creating investment portfolios, conducting financial performance analyses, and auditing DA-PCC Institutional Herds, Processing and Marketing Outlets, and DA-PCC Clients along the Value Chain.

GISELLE M. SACUPASO

Financial Analyst I

Giselle M. Sacupaso is a Financial Analyst at the Monitoring and Business Planning Support Section under the Planning and Information Management Division of DA-PCC. She is a graduate of BS Accounting Technology at Central Luzon State University and took BS Accountancy at Dr. Gloria D. Lacson Foundation Colleges, Inc. She was assigned to monitor the Processing and Marketing Outlet (PMO) Dashboard of DA-PCC Regional Centers and visited different dairy boxes and client PMOs across the country to audit their stores and processing facilities. She is also responsible for auditing their financial statements. She also helps the Internal Audit Section in auditing the DA-PCC Regional Centers as well as the center's Institutional Herds and PMOs.

ERICKA JOYCE L. MALLARI

Former Internal Auditor I

Ericka Joyce L. Mallari is a graduate of BS Mathematics major in Business Application at Bulacan State University. She is worked as an internal auditor in the Internal Audit Section. Part of her work is to perform a value-for-money audit of DA-PCC's 12 regional centers, including the Institutional Herd and Processing and Manufacturing Outlet. She also assists the Business Development and Commercialization Unit (now Monitoring and Business Planning Support Section) in auditing the DA-PCC-managed cooperatives' dairy boxes, processing, and manufacturing facilities.

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GOT QUESTIONS OR SUGGESTIONS?

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 **DA-Philippine Carabao Center**

 **DA-Philippine Carabao Center**



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DA-PCC K-Portal



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DA-PCC Virtual Tour



To know more about DA-PCC's services and facilities, you can now explore the National Headquarters and Genepool via virtual tour which can also be accessed in the agency's official website.