How can we optimize the use of the carabaos through dairy enterprise modules?

How does carabao-based products reach the market?

and how can we help improve the carabao industry?
Objectives

1. To analyze the value chain of carabao and carabao-based products in selected regions in Luzon:
   - Nature and structure of the industry
   - Players by segment
   - Value chain maps
   - Economic analysis
   - Determine support services
   - Analyze the business enabling environment
   - Identify and analyze the constraints and opportunities

2. Suggest specific policy directions and strategies:
   - to improve the carabao industry in general and specific value chains of selected carabao-based products in particular.

The value chain framework used in the study
Approach and Methodology

Region 1  La Union and Pangasinan
Region 2  Cagayan and Isabela
Region 3  Nueva Ecija-NIZ, Bulacan and Pampanga-RIZ
Region 4A  Batangas, Cavite, and Laguna-Metro Manila

Presence of SUC-based PCC implementing institutional dairy buffalo enterprise modules (DMMMSU, CSU, CLSU, and UPLB);
Presence of high carabao inventory;
Presence of PCC-assisted farmers’ cooperatives/associations.

Methods of Data Collection & Analysis

Data Collection
- Secondary data collection
- Field survey of key players in the value chain
- Key informant interviews (PCC Officers & Staff, DTI Staff, and LGUs; and Meat Inspectors);
- Focus group discussion (VBAITs and LGU-PVO AITs); and
- Field observation and photo documentation.

Data Analysis
- Trend analysis for time-series data (carabao inventory, milk production with the use of graphs and growth rates
- Descriptive analysis with the aid of tables and figures
- Economic analysis - cost and returns analysis - financial position of key players in the value chain
### No. of Respondents by Type of VC Players:

#### Carabao’s milk & milk products (334)
- Farmers: 185 (55%)
- Forage farm managers: 1 (<1%)
- Institutional herd farm managers: 3 (1%)
- AI technicians: 40 (12%)
- Milk collectors: 20 (6%)

#### Processors: 29 (9%)
- Independent: 16 (5%)
- Cooperative-based: 9 (3%)
- Federation-based: 1 (<1%)
- Processing plant: 3 (1%)

#### Wholesaler-retailers/dairy outlets: 29 (9%)
- Retailers: 8 (2%)
- Institutional buyers: 7 (2%)
- End-consumers (Indian Nationals): 12 (4%)

---

**Global Situation**

- **Asia** – 97%
- **Africa** – 2%
- **America, etc.** – <1%

**Total heads:** 194M

- #1 **58%** (109M heads)
- #2 **18%**
- #3 **12%**
- <1% Europe, America, Oceania

**2% Africa**

**97% Asia**

**2.9M heads**

**#6 2% share**
### Production Trends

**Carabao population (‘000 heads) by region, Luzon, Philippines, 2010-2014**

<table>
<thead>
<tr>
<th>Region</th>
<th>Year</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Average Annual Growth Rate(%)</th>
<th>% Share 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>2010</td>
<td>3,133.0</td>
<td>3,003.6</td>
<td>2,931.6</td>
<td>2,885.7</td>
<td>2,856.8</td>
<td>(2.3)</td>
<td></td>
</tr>
<tr>
<td>Region 1</td>
<td>2011</td>
<td>163.8</td>
<td>150.7</td>
<td>155.3</td>
<td>157.5</td>
<td>157.0</td>
<td>(1.0)</td>
<td>5.5</td>
</tr>
<tr>
<td>Region 2</td>
<td>2012</td>
<td>308.2</td>
<td>285.6</td>
<td>266.4</td>
<td>255.3</td>
<td>250.3</td>
<td>(5.0)</td>
<td>8.8</td>
</tr>
<tr>
<td>Region 3</td>
<td>2013</td>
<td>209.0</td>
<td>203.0</td>
<td>203.5</td>
<td>209.2</td>
<td>216.2</td>
<td>0.9</td>
<td>7.6</td>
</tr>
<tr>
<td>Region 4A</td>
<td>2014</td>
<td>170.3</td>
<td>170.5</td>
<td>170.4</td>
<td>172.3</td>
<td>173.3</td>
<td>0.4</td>
<td>6.1</td>
</tr>
</tbody>
</table>

**CAUSED BY:**

1. Rapid urbanization = reduced the pasture land and forage for carabao;
2. Aging population of carabao farmers who are forced to sell carabao;
3. Increasing trend of slaughtered native and male carabaos in some regions in Luzon.

Downward trend
### Domestic Situation

**Carabao Milk Production of Dairy Farms by Region, Luzon, Philippines, 2013-2014 (Source: PCC)**

<table>
<thead>
<tr>
<th>Region</th>
<th>Milk Production (L)</th>
<th>Growth Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>32,945 41,980</td>
<td>27.4</td>
</tr>
<tr>
<td>2</td>
<td>109,006 149,338</td>
<td>37.0</td>
</tr>
<tr>
<td>3-NIZ</td>
<td>487,302 509,324</td>
<td>4.5</td>
</tr>
<tr>
<td>3-RIZ</td>
<td>146,905 175,885</td>
<td>19.7</td>
</tr>
<tr>
<td>4A</td>
<td>169,885 174,448</td>
<td>2.7</td>
</tr>
</tbody>
</table>

- 1 dairy coop, 1 dairy assoc., and 4 other dairy farms
- 3 institutional dairy farms, 4 dairy coops, and 2 dairy assoc.
- 54 dairy farms
- 2 institutional dairy farms and no. of dairy farms (coops/assoc.) in 2013=12, 2014=19
- 1 institutional dairy farm and 3 dairy cooperatives

### Rising population of CROSSBRED BUFFALO

4.5L milk per head per day

### Domestic Situation

**Highly Saleable Carabao’s Milk and Milk Products**

**Region 1:**
- Fresh milk
- Choco milk

**Region 2:**
- Choco milk
- Pastillas de leche
- Milk candy

**Region 3 (NIZ):**
- Fresh milk
- Choco milk
- Pastillas de leche
- Yoghurt

**Region 3 (RIZ):**
- Pastillas de leche

**Region 4A:**
- Fresh milk
- Choco milk
- Pastillas de leche
- White cheese
Geographic flow of carabao’s milk and milk products in Region 3 (NIZ & RIZ), Luzon
Geographic flow of carabao’s milk and milk products in Region 3 (NIZ & RIZ), Luzon

- RAW MILK
- FRESH MILK
- CHOCO MILK
- PASTILLAS

Geographic flow of carabao’s milk and milk products in Region 3 (NIZ & RIZ), Luzon

- RAW MILK
- FRESH MILK
- CHOCO MILK
- PASTILLAS
Geographic flow of carabao’s milk and milk products in Region 3 (NIZ & RIZ), Luzon

Value Chain
**BUSINESS ENABLING ENVIRONMENT**

- Philippine Carabao Center (R.A. 7307 of 1992)
- Bureau of Agriculture and Fishery Product Standards (BAFPS)
- Food Safety Act of 2013 (R.A. 10611)
- National School Feeding Program (NSFP) Act (House Bill 5618)
- Buyback Ordinance for the Protection and Development of Female Carabaos (Riverine Buffaloes and Crossbreds)
  - San Jose City, Nueva Ecija (Ordinance No. 012-34)
  - Alaminos City, Pangasinan (Ordinance No. 170-2013)
  - San Agustin, Isabela (Municipal Ordinance No. 2008-05)

---

**Cost and Returns Analysis of Carabao Raw Milk Production by Region, Luzon, Philippines**

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Income</th>
<th>Total Costs</th>
<th>Net Income</th>
<th>Net Cash Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>194,154</td>
<td>89,449</td>
<td>104,705</td>
<td>32,674</td>
</tr>
<tr>
<td>2</td>
<td>217,379</td>
<td>86,849</td>
<td>130,531</td>
<td>31,029</td>
</tr>
<tr>
<td>3-NIZ</td>
<td>460,599</td>
<td>176,717</td>
<td>283,882</td>
<td>194,506</td>
</tr>
<tr>
<td>3-RIZ</td>
<td>344,069</td>
<td>98,945</td>
<td>245,124</td>
<td>115,584</td>
</tr>
<tr>
<td>4A</td>
<td>276,596</td>
<td>93,872</td>
<td>182,724</td>
<td>107,022</td>
</tr>
</tbody>
</table>

- Income: raw milk sales (40-60%), carabao inventory (30-50%)
- Major cost contributors: labor (20-55%), feeds & concentrates (15-35%)

✓ Carabao dairying is a profitable enterprise
## Financial Position of VC Players for 1L Fresh Milk, Luzon, Philippines

<table>
<thead>
<tr>
<th>Player</th>
<th>Product</th>
<th>Costs (PhP)</th>
<th>Selling Price (PhP)</th>
<th>Profit (PhP)</th>
<th>Margin to Retail Price (PhP)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total Unit Cost</td>
<td>Added Unit Cost</td>
<td>Added Unit Cost %</td>
<td>Unit Profit</td>
</tr>
<tr>
<td>Farmer</td>
<td>Raw milk</td>
<td>18.3</td>
<td>18.3</td>
<td>35</td>
<td>48.8</td>
</tr>
<tr>
<td>Milk collector</td>
<td>Raw milk</td>
<td>55.2</td>
<td>6.4</td>
<td>12</td>
<td>62.3</td>
</tr>
<tr>
<td>Processor</td>
<td>Fresh milk</td>
<td>84.4</td>
<td>22.2</td>
<td>43</td>
<td>107.0</td>
</tr>
<tr>
<td>Retailer</td>
<td>Fresh milk</td>
<td>112.0</td>
<td>5.0</td>
<td>10</td>
<td>117.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>51.9</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Wholesaler - Retailer**

- **Processor**
- **Milk collector**
- **Farmer**

**Price Structure of Carabao’s Milk and Milk Products, Region 3**

- **Parturient Milk**
  - Wholesale Price: PhP 11.00
  - Retail Price: PhP 11.00
- **Ghee Milk**
  - Wholesale Price: PhP 60.00
  - Retail Price: PhP 80.00
- **Partido de Leche**
  - Wholesale Price: PhP 29.00
  - Retail Price: PhP 40.00
- **Raw Milk**
  - Wholesale Price: PhP 57.57/L
  - Retail Price: PhP 57.57/L

**Flowchart:**

1. Farmer
2. Milk Collector
3. Processor
4. Wholesaler - Retailer

**Diagrammatic representation:**

- Farmer
- Milk Collector
- Processor
- Wholesaler - Retailer
### Demand for Carabao’s Milk and Milk Products, Luzon, Philippines, 2014–2017

<table>
<thead>
<tr>
<th>Region</th>
<th>Demand (L)</th>
<th>Production (L)</th>
<th>Surplus (Deficit)</th>
<th>Future Demand (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>62,958</td>
<td>41,980</td>
<td>(20,978)</td>
<td>87,658</td>
</tr>
<tr>
<td>2</td>
<td>195,382</td>
<td>149,338</td>
<td>(46,044)</td>
<td>270,331</td>
</tr>
<tr>
<td>3</td>
<td>469,665</td>
<td>685,209</td>
<td>215,544</td>
<td>761,313</td>
</tr>
<tr>
<td>4A</td>
<td>146,880</td>
<td>174,488</td>
<td>27,608</td>
<td>284,850</td>
</tr>
<tr>
<td>Total</td>
<td>874,885</td>
<td>1,051,015</td>
<td>176,130</td>
<td>1,404,152</td>
</tr>
</tbody>
</table>

### Demand for Raw Milk by Institutional Buyers in Metro Manila, Philippines, 2014–2017

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional Buyers:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pizza Restaurant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Quezon City and Makati)</td>
<td>21,600</td>
<td>28,800</td>
<td>(7,200)</td>
</tr>
<tr>
<td>Ice Cream Parlor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Quezon City)</td>
<td>3,600</td>
<td>17,100</td>
<td>(13,500)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>25,200</td>
<td>45,900</td>
</tr>
</tbody>
</table>

### Constraints

- Poor farm to market roads
- Poor milk handling
- Milk spillage while in transit to the market
- Inadequate milk processing capability, facilities and equipment
- Market awareness
- Task 1: Input Provision
- Task 2: Carabao Grazing/ Milk Production
- Task 3: Collection/ Storage
- Task 4: Processing
- Task 5: Testing/ Marketing
Input Provision/Production (Carabao’s Milk)

- Insufficient feeds (roughage/concentrate) and water supply
- Non-attainment of target number of calf drop - low success rate/low conception rate of AI
- High mortality rate of purebred animals (Italian Mediterranean)
- Limited number of breedable carabaos due to high male-to-female ratio (R1-53:47; R1-2-57:43; R4A-56:44)
- Poor growth performance of carabao
- Unavailability of credit support to carabao production

Competitiveness Vision

Within the next five years, the carabao industry should focus on enhancing its capacity and capability to increase healthy and productive crossbred carabao population, produce quality and safe carabao-based milk products responsive to the growing domestic demand, and establish strong market linkages among concerned VC players.
Upgrading Strategies/Interventions

1. Implementation of proper forage development, conservation and management

2. Enhancing the productivity and reproductive efficiency of carabao for milk

4. Enhancing logistics, infrastructure and processing and marketing support facilities and equipment

5. Engaging in product development initiatives to extend the shelf-life of milk and milk products and also improve its packaging and labelling
6. Development of price scheme that is tied up with established standards for quality milk, i.e., percentage of fat content, presence of water and adulterants, handling, temperature, etc.

7. Aggressive market promotion and campaign to further increase the demand for carabao’s milk

8. Planning for registration and certification of carabao’s milk and milk products by the FDA

9. Organizing milk value chain stakeholders into clusters

10. Packaging and implementing a financing program that is accessible and suited to the needs of dairy farmers and farmers’ cooperative/association-based Processors
Policy Directions

Include in the “Multiplier farms” strong farmers’ coops and assoc., cluster of farmers and individual progressive farmers as strategic partners in the distribution of purebred under a modified ‘paiwi’ scheme.

Qualification – strong commitment in helping smallhold farmers to increase their carabao holdings and ultimately their disposable incomes

Policy Directions

NEFEDCCO and other dairy coops/associations should submit position paper and lobby strongly for final enactment of HB 5618-the National School Feeding Program Act (NSFP). It will boost carabao milk consumption and production.

Key features:

- Address incidence of malnutrition, declining academic performance and drop outs among children
- Mandates provision of free meals including milk for all public kindergarten and elementary pupils
- Provides tax incentives to private agricultural companies and others for donating food, milk, juices and vitamins, supplements and other similar products to the NSFP
Advancing the Carabao Industry

Value Chain Analysis of Carabao and Carabao-based Products in Luzon, Philippines

Flordeliza A. Lantican, Ph.D.
VCA Specialist and Project Leader