

INDONESIA AUSTRALIA
RED MEAT & CATTLE
PARTNERSHIP



CATTLE BUSINESS SUSTAINABILITY PLAN AND PROJECTION

PT. CAHAYA ABADI PETANI



IACCB
Indonesia-Australia Commercial Cattle Breeding Program

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CHAPTER 1. INTRODUCTION/ BACKGROUND

PT Cahaya Abadi Petani (CAP) is an agricultural enterprise that was formed by Yayasan Salafiyah Ushuluddin (YSU). CAP is using an open grazing system on 160 hectares of land to run a herd of approximately 100 breeders and their calves. It is located at Desa Sungai Jelai, Tanah Laut District in the province of South Kalimantan. IACCB provided 103 Brahman-cross (BX) heifers and 8 bulls (5 local bulls and 3 BX bulls) as its contribution to establishment of CAP's cattle breeding operation.

The CAP team had some experience managing Bali cattle but no experience with BX cattle prior to collaboration with IACCB. Bali cattle were kept in a small paddock and managed in a traditional way. The CAP team consists of graduate Islamic

boarding school scholars with no skills or knowledge of cattle husbandry. Despite many challenges and obstacles faced in implementing the commercial breeding project, the team is gradually improving in capability with the support of IACCB.

From a technical point of view, there is the need for improved practical skills and knowledge to achieve optimal productivity. Over the first two years, CAP struggled with some issues including the overgrazing of pastures during the dry season, inconsistent supply of feed supplements, a high turnover of the employees and a lack of skills that resulted in low overall productivity of the operation, particularly low calving rates and high calf mortality rates.



CHAPTER 2. HERD STATUS

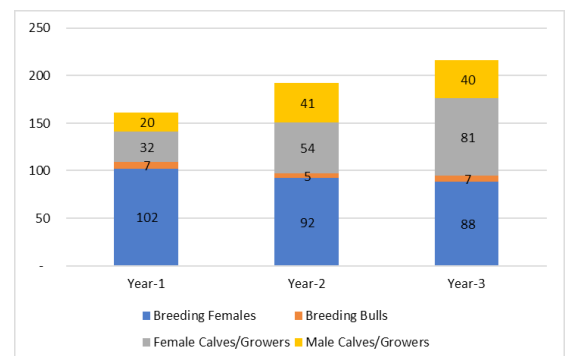
CAP started the Brahman Cross (BX) cattle breeding business in August 2017 with 103 heifers and 8 bulls (3 imported and 5 local bulls). By end of year 1 (July 2018), 52 calves were born. Accounting for the death of one bull and the sale of one cow, this resulted in a total herd size of 161 head. In Year 2 there was additional investment of 3 breeding bulls from IACCB whereas nine cows and 5 bulls were sold due to low performance. An additional 51 calves were born in Year 2, resulting in a total herd size of 192 head by end of Year 2 (July 2019). CAP sold 14 weaners and seven cull cows in Year 3. With mortalities and an additional 48 calves born, the total herd increased to 216 head.

Cows grazed in the pasture during the day and returned to the pen at night in the first year of operation. Additional King grass was cut and provided in the pens at night. The condition of cows declined slowly during this period as pastures became more heavily grazed and cattle numbers increased.

In the second year, cattle remained in the paddock at all time. Pasture improvement

was conducted in an area of 15 ha using *Paspalum atratum* cv Ubon + *Brachiaria* hybrid Mulatto. As cattle had to be excluded for 6 months to allow for pasture establishment this put further pressure on the grazing resource and the condition of cows deteriorated further. Rice straw and maize stover were provided with additional of PKC at 1-1.5 kg / head / day. The supply of PKC was initially unreliable but a more stable supplier was eventually found. The ration of PKC was then increased to 2.5 - 3.5 kg/head/day. Since this increase in ration was provided in early 2020 the body condition score (BCS) of cows has remained stable until now (December 2020). Herd expansion is summarized in Figure 1.

Figure 1. CAP Cattle Stock Expansion Yr1 – Yr3¹



¹ Yr1 is from Aug-17 to Jul-18, Yr2 is from Aug-18 to Jul-19 and Yr3 is from Aug-20 to Jul-20



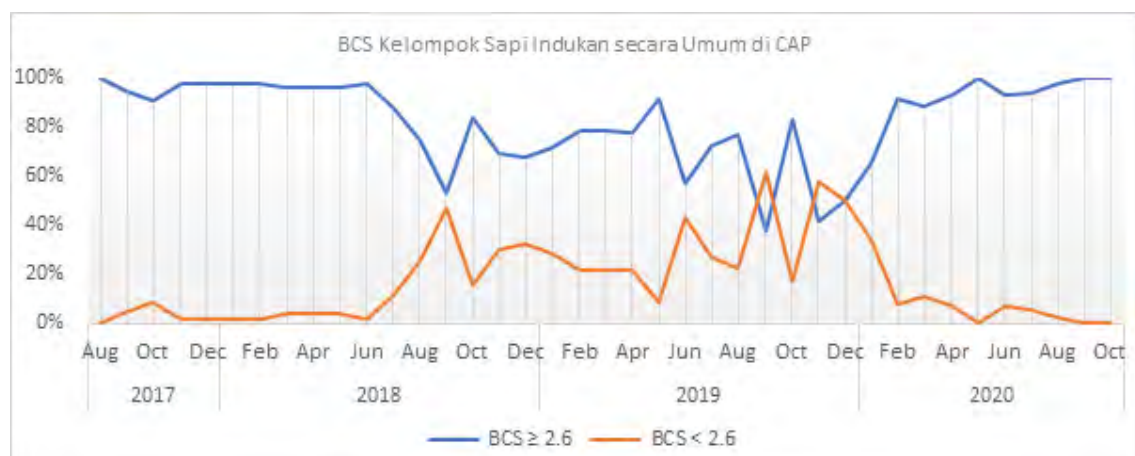
CHAPTER 3. HERD KEY PERFORMANCE INDICATORS

Body Condition Score (BCS):

Figure 2 provides an overview of the BCS condition of the cows since the start in 2017. The graph shows that CAP was able to maintain the BCS of the breeders in Year 1. From mid-2018 until early 2020, CAP was unable to maintain BCS of the breeders with a large percentage of the

herd dropping below BCS 2.6² due to long dry season, lack of quantity of feed offered and an inconsistency supply of feed supplements. The situation then improved in early 2020 when CAP was able to consistently provide feed supplements.

Figure 2: BCS of breeder cows 2017 – 2020



² BCS score 1 to 5 scale with 1 excellent and 5 very poor. Breeders need to maintain a BCS of >2.6

Key Performance Indicators (KPIs):

Key performance indicators i.e. Conception rate, calving rate, calf mortality rate,

weaning rate and grower mortality rate for the herd are shown in Table 1.

Table 1. Key Performance Indicators³

Parameter	Year 1	Year 2	Year 3	Year 4 ⁴	Avg. Yr3 & Yr4	Benchmark ⁵
Conception Rate	80.6%	71.6%	48.9%	21.6%	35.3%	> 80%
Calving Rate	50.5%	50.0%	52.2%	55.7%	53.9%	> 70%
Calf Mortality Rate ⁶	0.0%	11.8%	2.1%	3.0%	2.1% ⁷	5-10%
Weaning Rate	11.7%	61.8%	60.9%	61.4%	61.2%	> 65%
Grower Mortality Rate	0.0%	3.2%	5.4%	2.0%	3.6% ⁸	< 2%

The KPI achievements at CAP remain well below expected benchmarks. The primary cause for the results is that the BCS of breeders could not be consistently maintained after the first calving and were on average too low to ensure cattle were in an optimal condition to conceive. The low conception rates then resulted in low calving and weaning rates and long calving intervals.

Calving Interval (CI):

The calving interval is the average number of months between calves for the herd. For newly established herds the first year is excluded from the calculation as it is an adaptation and conception period. The ideal calving interval is 12 months, but a more realistic benchmark for a grazing operation is 15 months. CAP achieved a calving interval of 23 months.

The calving interval was calculated using the following formula.

$$\text{"Estimate of CI"} = \frac{\text{Project period (month) } \times \text{ number of initial cows stock at the intended period}}{\text{Total calves born up to the intended project period}}$$

$$\text{Estimate of CI in CAP} = \frac{27 \text{ months } \times 94}{111} = 23 \text{ months}$$

4 For that specific 12-month period (Aug-Jul)

5 KPIs for Yr1, Yr2 and Y3 are actual achievements and for Yr4 is a projection up to Jul-21

6 The benchmarks provided are best practice estimates. Benchmarks can be raised every few years as overall industry performance improves

7 The average uses the actual rate of Year 3

8 4 weaners/growers died out of 138 calves weaned



CHAPTER 4. ECONOMIC VIABILITY

In order to analyse economic viability of the enterprise we examined daily costs including feed and operational costs, cost-

of-gain and production cost for respectively weaners and feeders.

Average daily costs/head – Cows

Parameter	Year 1 ⁹	Year 2	Year 3	Year 4	Avg. Yr3 & Yr4
Feed cost	IDR 2,990	IDR 1,616	IDR 3,726	IDR 4,213	IDR 3,969
Operational cost ¹⁰	IDR 3,118	IDR 3,921	IDR 2,657	IDR 1,966	IDR 2,312
Total costs	IDR 6,108	IDR 5,537	IDR 6,383	IDR 6,179	IDR 6,281

In year 1 cattle grazed pastures during the day and returned the cattle into pen during nights. This semi-intensive model of production resulted in relatively low feed costs and moderate operational costs. In year 2 cattle were on pasture permanently, resulting in very low feed costs. Palm kernel cake was provided in Year 3 raising

feed costs to IDR 3,726. In year 4 (only 3 months data), CAP increases the volume of feed intake resulting in an average feed cost of IDR 4,213¹¹. The average total cost of maintaining cows over the 4-year period was below IDR 6,500 per head per day. In comparison with other Indonesian breeding systems this is a low cost.

Average Daily Costs/hd- Growers 91011

Parameter	Year 1	Year 2	Year 3	Year 4	Avg. Yr3 & Yr4
Feed cost	IDR 2,743	IDR 1,780	IDR 3,143	IDR 3,468	IDR 3,305
Operational cost	IDR 3,118	IDR 3,921	IDR 2,657	IDR 1,966	IDR 2,312
Total costs	IDR 5,861	IDR 5,702	IDR 5,800	IDR 5,434	IDR 5,617

⁹ The calculation of average costs at Yr1 is from Aug-17 to Jul-18, Yr2 is from Aug-18 to Jul-19, Yr3 is from Aug-19 to Jul-20 and Yr4 is from Aug-20 to Oct-20 (3 months).

¹⁰ Operational costs include labor, utilities, maintenance and other overhead costs and the formula of average operational costs is total operational costs divided by total number of cows and growers.

¹¹ The price of PKC also increased at this time, contributing to higher costs

The average feed costs for growers fluctuated in line with the changes to the feeding system. In year 4, the growers were transferred to pens in Banyu Irang where they were provided with tofu waste and concentrate. In average for the last 4 years, total costs were below IDR 6,000 per head per day for growers. This is also a low cost of production.

Cost of Gain (COG) and Feeder Liveweight Production Cost

The ADG grower growth of CAP was 0.43 kg and with average daily costs of IDR 5,613 per day, the cost of gain is circa IDR13,000 per kg liveweight. Considering that cattle sell for over IDR40,000 per kg liveweight this provides the basis for a profitable

enterprise.

In the below 'Calculator: calf, weaner and feeder production cost' we consider the parameters of calving and weaning rates, daily cost and targeted liveweight of a feeder to calculate the projected production cost of 320 kg feeders,

The feeder production cost at CAP is around IDR 22,900/kg liveweight. This is 43% below the cost of an imported Australian feeder (which averaged between IDR 40,000 and IDR 45,000 in 2019). CAP has the potential to further reduce costs by increasing the conception, calving and weaning rates, which are unacceptably low at present.

Calculator: Local calf, weaner and feeder production

Cow-Calf-Weaner	Feed costs (hd/day) – Cows	IDR 3,969
	Operational costs (hd/day)	IDR 2,312
	Sub-total (hd/day)	IDR 6,281
	Calving Rate	53,9%
	Daily Costs	IDR 11,648
	Costs/calf born (A)	IDR 4,251,431
	Calf mortalities	2,1%
	Cost of calf mortalities (B)	IDR 90,308
Weaner Cost /hd (A+B)		IDR 4,341,739
Weaner-Grower	Calf age at weaning (months)	4 mths
	Calf weight at weaning (kgs/hd)	100 kg
	Grower weight gain (kgs/hd/day)	0,43 kg
	Target weight at sale	320 kg
	Months required (Weaning to sale)	17 mths
	Feed costs (/hd/day) – Growers	IDR 3,305
	Operational (/hd/day)- Cows + Growers	IDR 2,312
	Sub-total costs to weaning (/hd/day)	IDR 5,617
	Grower mortalities	3.6%
	Cost of Grower mortalities /hd (C)	IDR 108,597
Grower Costs /hd (D)		IDR 2,982,480
Total costs/hd/feeder (A+B+D)		IDR 7,324,219
Local Production Cost /kg		IDR 22,900

The calculator also shows:

- the production cost of a weaned calf at CAP is IDR 4,3 million
- the production cost of a 320 kg liveweight feeder is about IDR 7,3 million
- a liveweight of 320 kg can be reached 17 months after weaning (with the assumption weaning at 4 months results in calves of 100kg)



CHAPTER 5. SUSTAINABILITY PLAN AND PROJECTION

The key objective of this plan is to provide business guidance for CAP to sustain their breeding business. We aim to make recommendations that can be addressed based on CAP’s management, labor, infrastructure and finance capabilities.

The plan assumes a Year 4 starting point, with cows, calves, bulls and retained heifers grazed at the Pelaihari farm. Calves will be weaned by being relocated to the Banyu Irang pens. Banyu

Irang is also a hub centre for CAP’s cattle sales because of its location which is close to the cattle markets in Banjarbaru and Martapura. All weaners are transferred to Banyu Irang until they are sold or returned to Pelaihari as retained heifers. Cull cows and bulls will also be transferred to Banyu Irang to be fattened before they are sold.

General assumptions¹²

Based on the productivity/financial data trend, general assumptions for the sustainability plan are as follows:

Key Parameter	Assumptions	Comments
Simulation period	Up to yr-10 (Jul-27)	Yr-10 th after the project starts
Calving Rate	55% Yr4 60% Yr5 onwards	Previous 2-year average 54%
Calf mortality	3%	Assumption of 3% is equivalent to 2 hd (1 hd male calf and 1 hd female calf)
Feed Costs	IDR 5,400	Previous 2-year average IDR 3,969 Given additional feed intake to maintain the cows performance
ADG	IDR 4,900 0.43 kg	Previous 2-year average IDR 3,305 Given additional feed intake to maintain/improve the ADG Previous ADG 0.43 kg
Cattle Sales	45% Grower heifers from yr-5 onwards 100% Grower bulls from yr-5 onwards	Sold at 18 mths old, weight at 283 kg with sales price IDR 50,000/kg Previous sales price Sold at 24 mths old, weight at 362 kg with sales price IDR 60,000/kg Previous sales price

¹² Details % parameters are on Annexes 1 and Annexes 4

Key Parameter	Assumptions	Comments
Cull cows	12% from yr5 onwards	12% is equivalent to 12-13 hd/year All identified unproductive cows are sold
Selling price- Cull Cows	IDR 42,000/kg	Annual increase 1% Previous sales price
Cull bulls	1 hd/year	Culled due to its lesser productive performance. Directly being replaced with productive bull
Selling price – Cull Bulls	IDR 47,000/kg	Annual increase 1% Previous sales price
Buying price – Productive bull	IDR 55,000/kg	Annual increase 1% Information from CAP
Retained Heifers	55%	More than half of all Grower heifers are retained to replace cull cows

Projection Results

CAP will use organic herd growth, retaining 55% of heifers. Using this strategy, CAP will manage 105-114 cows each year and a total herd of 192-248 head.

The projection indicates that cash flow will

become positive from year 4 onwards because sales revenue exceeds expenditures. At year 10 it is projected that CAP can achieve an internal rate of return (IRR) of 5.02%, with cumulative cash flow of IDR 1,745,807 and NPV IDR -1,216,340,664 (see details in Annexes 3)





CHAPTER 6. SUMMARY AND RECOMMENDATIONS

6.1. Improve Cattle Performance

Nr	Issue	Current KPI achievement	CAP Target
1	Calving Interval	23 months	15 months
2	BCS (Body Condition Score)	2.6 – 3.0	≥ 3.0
3	BCS Lactating cows	2.6 – 3.0	≥ 3.0
4	Calving Rate	55.7%	70%
5	Weaner Weight (4 months)	107 kg (at 4.7 months old)	100 kg
6	ADG (Average Day Gain)	0.43 kg	0.43 kg
7	Feed composition	<ul style="list-style-type: none"> Grazing pastures, i.e. improved and native grasses Supplement (PKC) Minerals mixed 	<ul style="list-style-type: none"> Grazing pastures, i.e. improved and native grasses Supplement (PKC) and other source of protein (SBM, tofu waste etc for weaners) Minerals mixed
8	Calf mortality	0.0%	Max 2%

6.2. Sustainability Plan

To achieve the plan's result as projected, CAP has to continuously address its low calving rate (50-55%) to 60% in year 5 onwards through better attention to feeding. With appropriate management a calving rate of 70% is achievable, further improving financial outcomes. CAP should also maintain the grower's ADG at 0.43 kg.

Table 6. Herd closing stock number

Category	No. of stock
Breeding Females	114 hd
Breeding Bulls	7 hd
Grower Heifers 12- mths	33 hd
Grower Bulls 12- mths	33 hd
Grower Heifers 12+ mths	31 hd
Grower Bulls 12+ mths	30 hd
Total Closing Stock	248 hd

ANNEXES 1.

CATTLE SALES AND RETAINED PARAMETERS

	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10
Calving Rate	55%	60%	60%	60%	60%	60%	60%
Cull							
Breeding Females	20%	12%	12%	12%	12%	12%	12%
Breeding Bulls	10%	10%	10%	10%	10%	10%	10%
Retained Heifers	65%	55%	55%	55%	55%	55%	55%
Growers Sales							
Heifers at 12-mths	7%	0%	0%	0%	0%	0%	0%
15-mths	0%	0%	0%	0%	0%	0%	0%
18-mths	30%	45%	45%	45%	45%	45%	45%
Bulls at 12-mths	30%	0%	0%	0%	0%	0%	0%
15-mths	10%	0%	0%	0%	0%	0%	0%
18-mths	30%	0%	0%	0%	0%	0%	0%
24+mths	100%	100%	100%	100%	100%	100%	100%

ANNEXES 2.

HERD GROWTH PROJECTION

	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10
Opening Stock								
Breeding Females		88 hd	105 hd	106 hd	105 hd	108 hd	110 hd	112 hd
Breeding Bulls		7 hd	7 hd	7 hd	7 hd	7 hd	7 hd	7 hd
Grower Heifers		81 hd	50 hd	54 hd	61 hd	61 hd	61 hd	62 hd
Grower Bulls		40 hd	30 hd	54 hd	61 hd	60 hd	60 hd	61 hd
Total Opening Stock		216 hd	192 hd	221 hd	234 hd	236 hd	238 hd	242 hd
Purchases								
Breeding Females		0 hd	0 hd	0 hd	0 hd	0 hd	0 hd	0 hd
Breeding Bulls		1 hd	1 hd	1 hd	1 hd	1 hd	1 hd	1 hd
Total Purchases		1 hd	1 hd	1 hd	1 hd	1 hd	1 hd	1 hd
Births		48 hd	64 hd	64 hd	64 hd	64 hd	66 hd	68 hd
Cattle Sales								
Grower Heifers		17 hd	12 hd	10 hd	13 hd	13 hd	13 hd	13 hd
Grower Bulls		32 hd	7 hd	23 hd	30 hd	29 hd	29 hd	29 hd
Cull Breeding Females		17 hd	12 hd	13 hd	12 hd	13 hd	13 hd	13 hd
Cull Breeding Bulls		1 hd	1 hd	1 hd	1 hd	1 hd	1 hd	1 hd
Total Cattle Sales		67 hd	32 hd	47 hd	56 hd	56 hd	56 hd	56 hd
Closing Stock								
Breeding Females	88 hd	105 hd	106 hd	105 hd	108 hd	110 hd	112 hd	114 hd
Breeding Bulls	7 hd	7 hd	7 hd	7 hd	7 hd	7 hd	7 hd	7 hd
Grower Heifers	81 hd	50 hd	54 hd	61 hd	61 hd	61 hd	62 hd	64 hd
Grower Bulls	40 hd	30 hd	54 hd	61 hd	60 hd	60 hd	61 hd	63 hd
Total Closing Stock	216 hd	192 hd	221 hd	234 hd	236 hd	238 hd	242 hd	248 hd

ANNEXES 3.

CASH FLOW PROJECTION

IN THOUSAND RUPIAH (000)

	≤Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10
Cash In								
Cattle Sales	IDR 595,235	IDR 1,155,614	IDR 578,805	IDR 931,281	IDR 1,123,642	IDR 1,133,497	IDR 1,146,238	IDR 1,158,980
Terminal Value	IDR 0	IDR 0	IDR 0	IDR 0	IDR 0	IDR 0	IDR 0	IDR 4,095,441
Sub Total Cash In	IDR 595,235	IDR 1,155,614	IDR 578,805	IDR 931,281	IDR 1,123,642	IDR 1,133,497	IDR 1,146,238	IDR 5,254,421
Cash Out								
Investment Costs	IDR 4,951,299	IDR 22,700	IDR 22,900	IDR 23,100	IDR 23,300	IDR 23,500	IDR 23,700	IDR 23,900
Operational Costs	IDR 1,006,113	IDR 515,626	IDR 532,737	IDR 576,866	IDR 590,433	IDR 600,679	IDR 610,958	IDR 625,117
Sub Total Cash Out	IDR 5,957,411	IDR 538,326	IDR 555,637	IDR 599,966	IDR 613,733	IDR 624,179	IDR 634,658	IDR 649,017
Cash Surplus (Deficit)	(IDR 5,362,177)	IDR 617,288	IDR 23,168	IDR 331,316	IDR 509,909	IDR 509,317	IDR 511,581	IDR 4,605,404
Cumulative Cashflow	(IDR 5,362,177)	(IDR 4,744,889)	(IDR 4,721,721)	(IDR 4,390,405)	(IDR 3,880,495)	(IDR 3,371,178)	(IDR 2,859,597)	IDR 1,745,807
Discount Factor	1,00	0,91	0,83	0,75	0,68	0,62	0,56	0,51
Present Value	(IDR 5,362,177)	IDR 561,171	IDR 19,147	IDR 248,922	IDR 348,275	IDR 316,246	IDR 288,774	IDR 2,363,301
Cumulative Present Value	(IDR 5,362,177)	(IDR 4,801,006)	(IDR 4,781,859)	(IDR 4,532,936)	(IDR 4,184,661)	(IDR 3,868,415)	(IDR 3,579,641)	(IDR 1,216,341)

ANNEXES 4.

SUMMARY OF SUSTAINABILITY PLAN AND PROJECTION

Current Status up to yr-3¹³

Herd Size	<ul style="list-style-type: none"> • 88 hd cows • 216 hd total herd
Investment	<ul style="list-style-type: none"> • IDR 4.95B (CAPEX) • IDR 1B (Op. Costs)

Projected at yr-10 (Jul-27)

	Organic Growth
Key plan (s)	<ul style="list-style-type: none"> • Retained heifers 55%
Required additional Investment	<ul style="list-style-type: none"> • IDR 163.1M (CAPEX) • IDR 4.052B (Op, Costs)
Herd Size	<ul style="list-style-type: none"> • 114 hd cows • 248 hd total herd
Cashflow positive	<ul style="list-style-type: none"> • Yr4 onwards
IRR	<ul style="list-style-type: none"> • 5.02%
NPV	<ul style="list-style-type: none"> • IDR-1,216B

13 Period from Aug-17 to Jul-20

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