

Indonesia-Australia Commercial Cattle Breeding Program

Six-monthly Progress Report February
2019 – July 2019

July 2019



When you
think with a
global mind
problems
get smaller

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Abbreviations

ASG	Advisory Support Group
BCS	Body Condition Score
BNT	Bio Nusantara Teknologi
BKB	Buana Karya Bhakti
CAP	Cahaya Abadi Petani
DAWR	Department of Agriculture and Water Resources
DFAT	Department of Foreign Affairs and Trade
EOPO	End of Program Outcomes
GESI	Gender Equality and Social Inclusion
Gol	Government of Indonesia
IACCB	Indonesia-Australia Commercial Cattle Breeding program
IRR	Internal Rate of Return
KAL	Kalteng Andinipalma Lestari
KPI	Key Performance Indicator
KPT	Koperasi Produksi Ternak (Farmer Cooperative)
M&E	Monitoring and Evaluation
MES	Monitoring and Evaluation System
MLA	Meat and Livestock Australia
MoA	Ministry of Agriculture
MoA	Memorandum of Agreement
NTB	Nusa Tenggara Barat/West Nusa Tenggara
RMCP	Red Meat and Cattle Partnership
ROI	Return on Investment
STA	Short Term Advisers
SA	Suitability Assessment
SO	Services Order
SISKA	Sistem Integrasi Sapi dan Kelapa Sawit
SPR	Sentra Peternakan Rakyat (Community Livestock Centre)
SUJ	Superindo Utama Jaya
TL	Team Leader
TOC	Theory of Change

Executive Summary

This Progress Report provides an overview of activities undertaken by the Indonesia Australia Commercial Cattle Breeding Program (IACCB) from February 2019 to July 2019. This period covers the first six months of the two-year no-cost extension (IACCB Phase 2). Phase 2 (February 2019 – February 2021) focuses on (1) conclusively determining the commercial viability of the three cattle breeding models, and (2) promoting the successful models to industry and government stakeholders and informing them of the potential of and barriers to industry growth.

The main program activities during the reporting period were as follows.

- Assessing the remaining capacity-building needs of all partners.
- Development of Phase 2 Memorandum's of Agreements (MOA) between IACCB and all project partners.
- The provision of technical support for maintenance of Body Condition Score (BCS); efficiently growing the weaners; identifying the appropriate weaning age and weight; selecting first year progeny heifers and bulls for expanding the herd; achieving reductions in key project cost areas; and optimising cost-of-gain.
- Conducting two final Commercial Viability Assessments (CVA).
- Finalising a plan for the phase-out of the cut-and-carry model and starting the closure of one of the SSKA projects as only the core business of the plantation will be maintained due to financial hardship of the company.

Key Deliverables

Four Commercial Cattle Breeding Modules developed based on the IACCB and partner experience of breeding BX cattle in the different models.

- Economics of Commercial Cattle Breeding in Indonesia
- Cattle Breeding Herd Management in Indonesia
- Pastures and Forages for Commercial Cattle Breeding in Indonesia
- Monitoring and Evaluation of a Cattle Breeding Enterprise in Indonesia

Three Indonesian Cattle Breeding Tools for Investors developed:

- **CALFIN** - for financial modelling and planning
- **CALPROS** - for monitoring small and medium-sized cattle breeding enterprises
- **CALPROF** - operations software (combined with feedlot and feed mill modules).



Improved Communications

- An **IACCB Quarterly Update Newsletter** was developed and distributed, that highlighted the commercial viability of SSKA and upcoming products (e.g. modules),
- The **revised IACCB web-site** provides more accessible information for potential investors.
- **Enhanced communications with the GOI Ministry of Agriculture (MoA) – including** MoA Secretary-general, the head of the MoA Agricultural Training Center and a presentation to the Deputy Director Bilateral Cooperation (as part of a DAWR initiative informing MoA on on-going Australian support in the sector) and the Directorate-General Livestock that improved the MoA knowledge on breeding Brahman Cross in Indonesia.

Phase 2 MoUs signed with all eight IACCB-partners that focus on improving partner staff capacity (technical and management), ensuring herd productivity, and promoting their respective breeding models i.

Hand-over of cattle to all four SSKA partners. Partners who were assessed as being Potentially Commercially Viable and had a strong commitment to animal welfare were handed over the cattle. The four small-holder partners agree to animal health and welfare and herd management KPIs which will be reinforced prior to cattle hand-over.

A new Small-holder collaboration with P4S Karya Mandiri Desa Kubu (Pusat Pelatihan Pertanian dan Perdesaan Swadaya) in Central Kalimantan is underway with the delivery of twenty pregnant BX-heifers, of which more than 50% have already given birth. P4S is an Indonesian Government supported Training Centre model that stimulates rural development through strengthening the capacity of member farmer groups and providing practical training for students in the agricultural sector. P4S has now added the breeding of Brahman Cross cattle to their curriculum. The P4S model has great scale up potential as the cut and carry model in Central Kalimantan can become an example of 'best practice' for the many P4S training centres in Indonesia and be set up to produce accredited Cattle Managers and workers, which is currently a key constraint to Industry growth.

Partner Progress

- **Herds are growing.** Since delivering 1,429 cattle to partners, 1,702 calves have been born, with some progeny retained and some sold. Current herd numbers represent a 75% increase over the cattle delivered.
- **SSKA-partners are investing but challenges remain.** Three out of four SSKA partners have plans to expand their herd, via selecting suitable heifers and bulls from the Year 1 progeny, and through acquiring additional breeding stock to achieve improved economies of scale. With the view to improving cash-flow three SSKA partners have started fattening trials with Year 1 progeny not selected for breeding, using waste-products from the palm-oil production process. A rapid positive cash-flow is now important for all SSKA partners as palm-oil prices have substantially fallen. One SSKA-partner, BNT, has decided to close down all activities in their plantation given they are running cash-flow negative and do not have the financial means to sustain the cattle pilot.
- **Good herd condition maintained and trends in productivity Key Performance Indicators (KPI) now visible.** 80% of the IACCB herd is in an ideal condition (BCS \geq 2.60), reflecting a thorough understanding, across all partners, of the importance of maintaining herd condition, an essential prerequisite for herd productivity and commercial sustainability.

Core challenges identified at start of Phase 2 are being addressed:

- **Improved partner management capacities** from better data-analysis via the introduction and application of CALFIN and CALPROF and support for pasture development and progeny selection.
- **Improved staff technical capacities** through IACCB capacity building in pasture development, weed control, feed composition for different cattle categories, farm design, pregnancy testing and herd selection.
- **Improved financial management capacities** via the introduction and application of CALPROF (integrated into plantation management software) and by Gita Pertiwi, a capacity-building service provider working with the small-holders.

- The **main on-going challenge** is the poor growth rate of weaners (0.3 kgs/head/day with an industry target of 0.6 kgs/head/day).

Preliminary conclusion on three breeding models: After more than 2 years of partner engagement and project delivery, key commercial performance indicators (conception rates, calving rates, weaning rates, calving intervals and Average Daily Gains) are starting to show trends, supporting a more definitive answer on the commercial viability of each model.

- **SISKA:** Highest commercial potential dependent on (1) good cattle and plantation integration (2), high quality and consistent herd management, (3) adequate cash-flow to support the ongoing needs of the cattle business, and (4) pasture development to ensure enough quality and quantity of feed, complemented by using palm oil waste products. Commercial viability is reflected in three out of the four SISKA-partners investing to significantly expand their cattle breeding businesses. Preliminary research results put savings in weed control at 9\$/ha/year and showed oil palm productivity improvement in one plantation at 5 to 12%, which bides very well for SISKA commercial viability.
- **Small-holder Cut-and-Carry:** Partners have shown that strong conception, calving and weaning rates and short calving intervals as well as reasonable growth rates can be achieved under a Small-holder Cut-and-Carry model. But on the other hand, Communal BX (and other) smallholder cattle breeding projects will find it very challenging to sustainably achieve commercial viability in a communal system given the challenges of the system itself. Communal breeding systems practiced by farmer groups are rare, except where the communal model is a necessity and is locally and socially accepted - providing collective security for the cattle. Critical factors to the communal system include cohesion of the group/cooperative, solid leadership and transparent management; cash-flow and member and leadership cattle breeding experience.
- **Open Grazing:** This model requires the least starting capital, and daily expenses per head, compared to other models. Sustainable commercial viability appears to be dependent on good management, pasture quality improvement, and the comparative advantage of using the available land for cattle breeding compared to other investment alternatives.

Budget challenges: The no-cost extension budget will result in the non-replacement of a key-staff, Robi Agustiar, one of two investment managers; a reduction in STA inputs (animal health and animal welfare; pasture development and feed composition; etc.) and technical visits to partner sites, potentially negatively impacting on the conclusive testing of the three models, and the achievement of the End of Program Outcome.

Planned Activities during the August 2019 – January 2020 period include:

- Promoting of IACCB results in SISKA including through: Presenting at the 11th Asian Sustainable Oil Palm Summit in Jakarta on 12-13 September 2019; Organising the Integrated Cattle and Oil-Palm Conference (ICOP 2019) in collaboration with the Indonesian Agency for the Assessment and Application of Technology (BPPT); Two Quarterly Updates focusing on the analysis of the commercial viability of the SISKA, the open grazing and the cut-and-carry smallholder models and launching of the technical modules and the investor tools for cattle breeding in Indonesia.
- Phasing-out of one SISKA-partner who decided, because of financial reason due to the very low palm oil prices, to focus on their core business of oil palm only and cease secondary enterprises including the cattle breeding business and the compost production using manure.
- Phasing out of the original two cut-and-carry small-holder partners, SPR and KPT, and planning for the phase-out of the remaining tree SISKA-partners and the planning phase-out of the Open Grazing partner.

1 Introduction

This Progress Report provides an overview of activities undertaken by the Indonesian Australia Commercial Cattle Breeding Program (IACCB) from February to July 2019. It details progress against the Annual Plan February 2019 – January 2020 and towards achieving the End-of-Program Outcomes (EOPO).

2 Program Background

IACCB was established under the auspices of the Indonesia Australia Red Meat and Cattle Partnership (RMCP). The Program initially ran between 5 February 2016 and 5 February 2019. DFAT provided for a two-year no-cost extension until 5 February 2021 to be able to consolidate the findings and promote its outcomes. The extension is managed by Coffey as the managing contractor.

The goal of IACCB is “Expansion of the beef cattle breeding industry in Indonesia” with EOPOs (1) Demonstrated increase in interest/investment in cattle breeding sector and (2) Demonstrated commercially viable beef cattle breeding models.

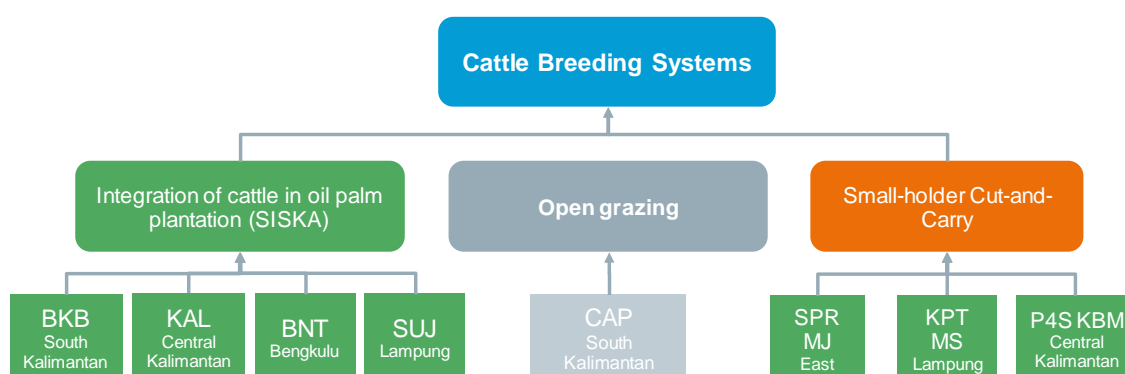
IACCB is tasked with diligently piloting three different cattle breeding systems¹ (see Figure 1) in eight locations and in collaboration with eight partners and promote evidenced commercial viability assessment results of the three systems to government and private sector to inform investment decisions.

The two-year extension of IACCB focuses on the consolidation of the models and the promotion of the results. IACCB’s slightly adapted Theory of Change for the extension period is shown in Annex 1 which highlights the increased attention to the promotional activities and interaction with the industry.

The IACCB program provides support to its carefully selected partners for piloting different breeding systems. The support aims to improve the partner’s capacity resulting in improvement in their cattle breeding and farm management practices which contribute to optimising the beef cattle breeding enterprises towards commercial viability. IACCB’s responsibility is to provide enough support to each partner, tailored to their needs, so that their breeding system has a high probability of achieving sustainable commercial outcomes.

IACCB’s knowledge management system captures on-farm learning (supporting and challenging factors) which is analysed to identify key requirements for a sustainable commercially viable enterprise. This information is promoted widely to government and private sector stakeholders to support investment and policy decisions.

Figure 1: Cattle breeding systems piloted and partners



¹ Piloting is done in eight different locations (five provinces) collaborating with eight partners of which seven are partners since the start of IACCB and one partner i.e. P4S KBM in Central Kalimantan is added during the extension.

3 Program Implementation

3.1 IACCB Herd Report

The IACCB partner herd is growing. IACCB granted 1,429 cattle to our Partners, comprising 1,315 heifers and 114 bulls. The current herd number is 2,505, representing a 75% increase.

1,702 calves have been born to date, including 285 during this reporting period. Most mortalities (total 15%) occurred in the SISKI-model and coincided with the peak of the rainy season, which reduced feed intake and increased screw fly strike and pneumonia.

At the 2.5-year mark, 29% of the calves born were 1st calves, 60% were 2nd, and the remaining 3rd. Partners are reluctant to cull unproductive cows (e.g. take a long time to get pregnant) adding to their cost base.

Table 1: Current Herd Numbers – All Partners (as per June 2019)

Cattle	BKB	KAL	BNT*	SPR	KPT	SUJ	CAP	P4S	Total
Heifers/ Cows	271	220	243	71	93	168	93	20	1,179
Bulls	24	20	25	4	6	14	5	1	99
Calves	66	4	103	5	5	66	15	19	321
Weaners/growers	292	185	114	31	82	132	70	0	906
Sub-total	653	467	485	111	186	380	183	40	2,505

*Includes BNT original herd of 24 cows

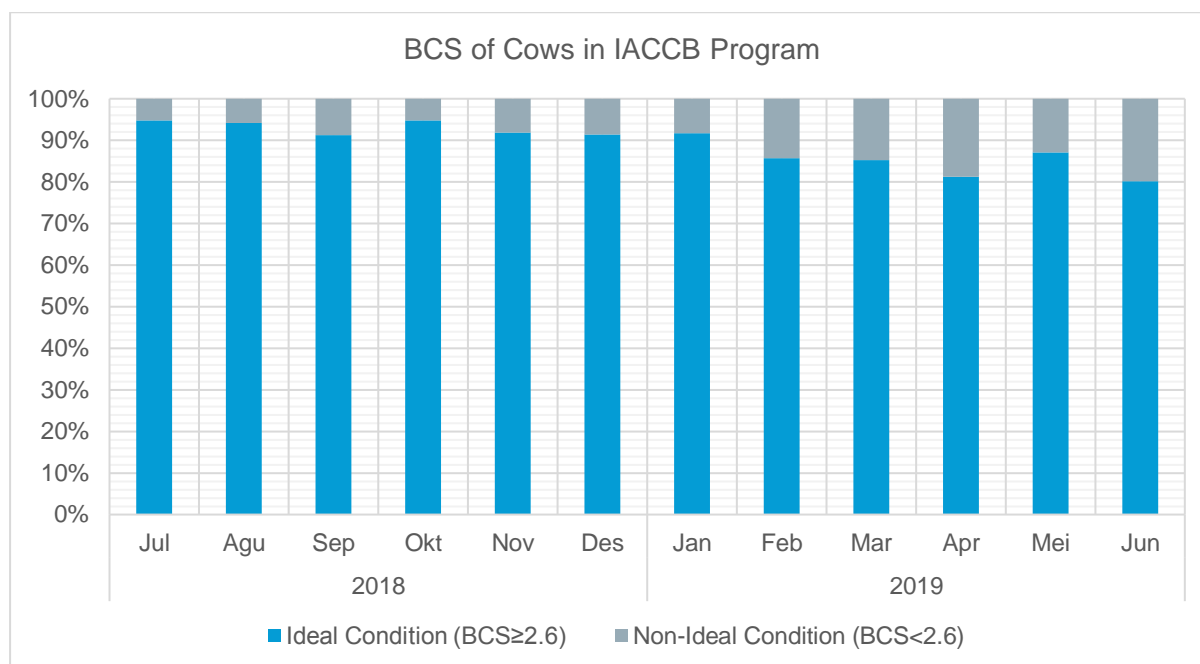
Table 2: Cattle Sales and Mortalities (since commencement) – All Partners

Cattle types	BKB	KAL	BNT*	SPR	KPT	SUJ	CAP	P4S	Total
Total Sales	17	47	86	115	93	51	17	0	426
Cull Heifers/ Cows	12	18	31	28	6	26	10	0	131
Cull Bulls	5	4	7	1	0	0	5	0	22
Weaners/Growers	0	25	48	86	87	25	2	0	273
Total Mortalities	56	47	56	11	16	52	7	1	245
Heifers/ Cows	17	12	3	1	1	2	0	0	36
Bulls	1	1	3	0	0	0	1	0	6
Calves	23	32	47	9	15	45	6	1	177
Weaners/Growers	15	2	3	1	0	5	0	0	26

Herd performance is very much dependent on the Body Condition Score of both heifers and bulls. BCS condition influences the health and productivity of the cow and the growth of the calves. Partners are now aware of the importance of maintaining the ideal BCS (BCS ≥ 2.6). Over the reporting period, BCS ideal condition fluctuated between 80 to 89% and currently averages 80% in the three models. (See Graph 1). BCS was negatively affected by high rainfall which limited dry matter intake, and the

unavailability of fodder to graze or harvest during the dry season in in the SISKAs projects. In small-holder projects BCS is mainly negatively influenced due to limited access to finances to acquire good quality feed in small-holder projects. Refer to Annex 2. for Culled cattle and Refunds.

Graph 1: Cows in Ideal Condition (BCS \geq 2.6)



3.2 Technical Assistance

3.2.1 Increasing Industry Knowledge and Skills

To address the core challenges identified at the start of Phase 2 - poor farm management, technical (cattle breeding) financial management and cattle marketing capacities - formal on-site training was conducted to ensure the person in charge of specific tasks, has enough knowledge and skills, and is aware of relevant Standard Operating Procedures (SOPs).

IACCB technical assistance included:

Improving farm management capacities – with a focus on better business planning, including for pasture development, progeny selection and data-analysis, all supported by the application of the following IACCB developed tools:

- **CALFIN** - for financial modelling and planning
- **CALPROS** - for monitoring small and medium-sized cattle breeding enterprises
- **CALPROF** - operations software (combined with feedlot and feed mill modules).

For more detailed description refer to Annex 3.



Improved staff technical capacities through visits by IACCB technical staff and on-the-job training to build staff capacity building in pasture development, weed control, feed composition for different cattle categories, farm design, pregnancy testing and herd selection. See Annex 4 and Annex 5 for more detail.

Improved financial management capacities – via the introduction and application of CALPROF (integrated into plantation management software), and through the efforts of Gita Pertiwi, a capacity-building service provider to small-holders. Gita Pertiwi delivered the 2nd Smallholder Workshop attended by SPR, KPT, CAP, and P4S staff that built their knowledge on BUMP Tani Sejadag - a cattle breeding and fattening business model, and on compost and liquid fertiliser production. All participants visited SPR to improve their awareness of the commercial consequences of fluctuating BCSs and its negative impact on herd productivity. Gita Pertiwi also mentored CAP and SPR to improve their administration processes, bookkeeping and financial analysis.

Improved SOPs – IACCB technical advisers worked with our partners to improve, and develop where absent, cattle breeding SOPs, based on their experience breeding BX-cattle over the last 2.5 years. These SOPs, including that related to Palm Oil and cattle breeding integration, will be made available to all investors.

Improved Marketing Capacities – A critical capacity gap highlighted by IACCB advisers, was lack of a person/s in charge, with sufficient firm capacities, to market/sell cattle. IACCB provided financial tools and built staff capacity in its use, that allows partners to accurately calculate production costs and determine an appropriate selling price and support the development of a marketing strategy. The tools estimate the right time, weight and price, to sell progeny. During this period partners have been selling progeny to support direct cash-flow or sold progeny to farmer members (in the small-holder model) or cooperatives linked to the companies (in the SISKAs model).

Table 3: Cattle Sales and Mortalities (since commencement) – All Partners

Cattle types	BKB	KAL	BNT*	SPR	KPT	SUJ	CAP	P4S	Total
Cull Heifers/ Cows (head)	12	18	31	28	6	26	10	0	131
Revenue (AUD)	10,539	27,924	28,556	544	5,148	33,637	14,097	0	120,445
Cull Bulls (head)	5	4	7	1	0	0	5	0	22
Revenue (AUD)	6,000	7,382	11,352	0	0	0	10,768	0	35,502
Weaners/Growers	0	25	48	86	87	25	2	0	273
Revenue (AUD)	0	26,438	48,921	62,982	99,375	19,553	0	0	257,269
Total Sales (head)	17	47	86	115	93	51	17	0	426
Total Revenue (AUD)	16,539	61,744	88,829	63,526	104,523	53,190	24,865	0	413,216

*1 AUD = IDR 10,000

3.2.2 Increased availability and higher-quality cattle forage

During the reporting period IACCB has continued its pasture development technical advisory support, which continues to be critical to commercial viability, due to the increase in herd size, and the need to grow the rapidly increasing numbers of weaners. Forage availability and quality is also important for cash flow, as it is the cheapest high-quality feed available (compared with cut-and-carry and feed concentrates). With IACCB support, partners are now investing in new land for pasture development and improving pasture on existing blocks. (See Table 4). For example, BKB are expanding their pastures into abandoned mining areas, and CAP built 3.5km of permanent fencing around improved pastures specifically for grazing their weaners.

Table 4: Pasture Planting Activity

	BKB	KAL	BNT	SUJ	CAP	P4S	Total
Legume (ha)	1.2	3.7	-	2.0	1.1	-	8.0
Grass (ha)	7.5	-	-	-	6.9	-	14.4

Within this reporting period, 177 kgs of seeds of selected grasses and legumes were provided to expand the pasture trials in different locations spread over 22.4 hectares of land. The pasture research results contribute to the knowledge base of improving pasture quality in different models. IACCB pasture expert, Ben Mullen reviewed previous pasture improvement mechanisation trials and provided specific recommendations to each partner. KAL recent weed management efforts under the plantation has improved forage availability in the grazing areas (now 90% previously 20%).

IACCB research confirmed that it is not technically or economically viable to develop vigorous improved pastures under established oil palms, due to low light intensity. Understory local grass cannot provide sufficient nutrition to achieve weaners and feeder high growth rates. Supplementary feeding or by developing improved pastures grown in open/full sun areas is required. To ensure commercial sustainability, SISKAs systems should develop all areas suitable for open pastures prior to the arrival of cattle, which should be used to graze weaners, cows with low BCS, and to rest bulls.

3.2.3 Contributing to Industry Growth

3.2.3.1 'Commercial Cattle Breeding in Indonesia' Technical Guidelines Developed

In this reporting period, the "Commercial Cattle Breeding in Indonesia" technical guidelines, consisting of 4 modules, were finalised.

1. Economics of Cattle Breeding in Indonesia
2. Herd Management: general ruminant nutrition, cattle selection, transportation and welfare, infrastructure, bull management, breeder (cow-calf) management, weaning, heifer management, animal health problems, and energy and protein rations
3. Pasture Management: Pastures for the tropics, establishing pastures, managing pastures, soil fertility and pasture selection, and pasture species
4. Enterprise Monitoring and Evaluation

The modules, will be updated as required, based on industry feedback, and will be available on the IACCB website in Quarter three 2019.

3.2.3.2 Positive findings from Ganoderma Research

In 2018, the Agency for the Assessment and Application of Technology - BPPT (Badan Pengkajian dan Penerapan Teknologi) undertook preliminary research for IACCB on the impact of cattle grazing under oil palm, specifically on soil fertility, oil palm productivity and the spread of Ganoderma.

Their research showed that after a minimum of 15 grazing cycles, productivity of oil palms at one plantation had improved by 5 to 12%, which bodes very well for SISKAs commercial viability. Results were however highly variable at a second plantation, with no consistent yield increase. Soil fertility data were highly variable, with no consistent patterns of impact emerging from the preliminary research. IACCB will continue to support this research with the view to obtaining more definitive results, expected in end of 2019.

The research also determined laboratory conditions Ganoderma was found not to spread in the presence of cow dung. Ganoderma spores were also killed by the acidic conditions in the rumen of cattle. These results indicate that Ganoderma is unlikely to be spread by cattle ingesting sporulating fruiting bodies, which was an ongoing concern of many in the palm oil sector.

3.2.3.3 Promotional materials produced and disseminated

The focus of IACCB Phase 2 is to (1) conclusively determine the commercial viability of the three cattle breeding models and (2) ensure IACCB findings and results and lessons learnt are communicated to potential investors and the GOI. Further detail in Annex 6. IACCB Outreach to Government and Industry.

In support of the latter the IACCB team, working closely with ASG Team Leader and Communication Adviser on the following.

- Reviewed and revised IACCB promotional materials to ensure they generate industry interest in IACCB findings, and capture current key lessons learnt – particularly around commercial viability of the SISKAs model. These materials will be used during the upcoming promotional events.
- Reviewed and revised the IACCB website so that it better attracts and retains the interest of potential investors, and to ensure the learning from the Program (e.g. modules and industry tools) easily available.
- Developed an “Three-monthly Update” that was aimed at generating interest in IACCB results in a wide range of stakeholders, most notably potential investors, GOI, and the RMC Partnership Board.

3.3 Program Outcomes

During this reporting period all partners, except for CAP and P4S, have completed the second year of their projects (since cattle arrived on-site). Refer to Annex 7 for more detailed information on individual Partner Progress.

Adequate productivity and commercial KPI datasets are now available for IACCB to make informed judgments on progress towards commercial viability, and the core challenges and opportunities associated with the three cattle breeding models.

80% of the cattle were in an ideal body condition ($BCS \geq 2.6$) end June 2019. Partners are now aware of the importance in maintaining herd BCS to meet productivity KPIs such as conception, calving and weaning rates.

Within this reporting period, most cows became pregnant with their second or third calf, with intensive small-holders systems achieving the highest conception rates.

Further in this section we provide detailed information about each of the KPIs for the three breeding models.

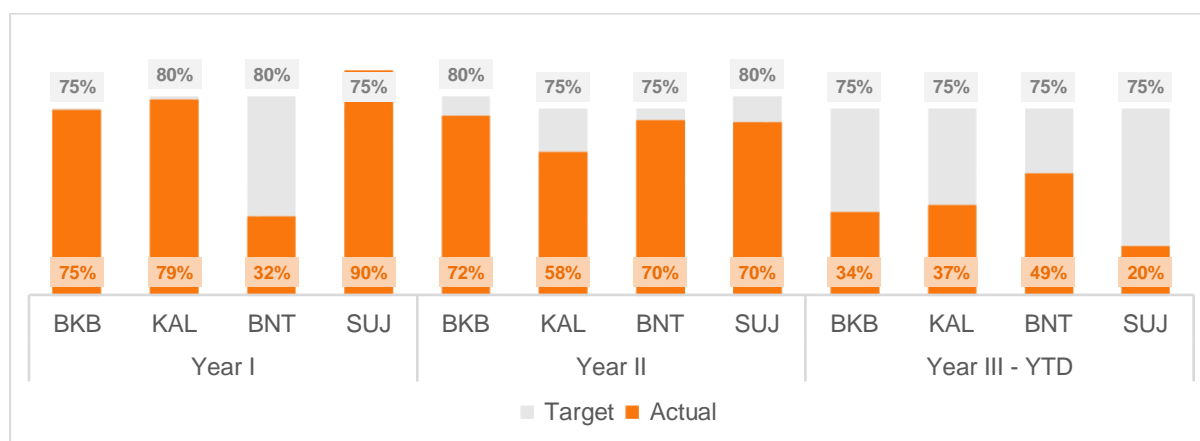
1. SISKA Model – Key Performance Indicators

The following paragraphs provide detailed KPI information and explanatory notes for the KPIs in the SISKA model which is characterised by extensive grazing under oil-palm trees.

Body Condition Score: Maintaining cows in ideal condition (BCS ≥ 2.6) is important to set the right conditions for reproduction success. Two partners, KAL and SUJ, maintained an excellent and consistent BCS for all their cows over the last 6 months given that more than 90% of cows (including lactating ones) have a BCS ≥ 2.6 . BKB's cows BCS had slipped during the dry season was able to improve BCS considerably towards the middle of the year with the use of fodder from their expanding pasture planting program. BNT struggled to achieve an 80% target due to the impact of the floods on pasture availability and with labor being diverted to post-flood recovery work.

Conception Rate – the conception rate is a good indicator of the productivity of the herd especially related to fertility. Details in Graph 2 show that Year 1² conception rates fluctuated heavily between 32 and 90%, showing problems in management of bulls (including late arrival of bulls) at partner level. Since Year 2 the conception rate figures are leveling off and stabilising around 70-75%. Preliminary figures for Year 3 indicate plantations maintaining the same percentage. These figures are within industry standards and support a commercially viable herd.

Graph 2: Conception rate – SISKA



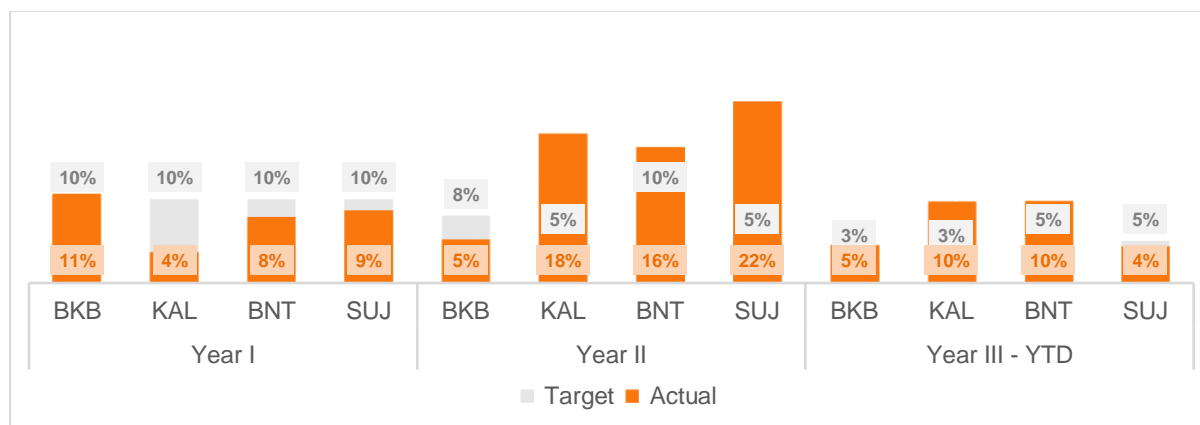
Calving Rate – the calving rate provides an estimate of the percentage of cows that will produce a calf during a 12-month period. BKB, which we consider as probably the best managed plantation-ranch integration, achieved 65% in Year 2 and already achieved that figure after 9 months in Year 3. SUJ, which uses a mixed model of partly breedlot and partly grazing achieved 76% in Year 2. We expect calving rates to average 70% or more in good plantations. We expect BNT, given the challenges with the floods, to score well below their KPI.

Calf mortality needs to be kept low to optimise the number of progenies which in the end defines income. The SISKA-model, where cows are grazed under the palm trees and calving often occurs in the plantation are more susceptible to the heavy rainy season which increases the risk of calf mortality due to the wet and cold conditions and secondary infections as pneumonia. Some partners are experimenting with bringing the pregnant cows inside the cattle yard, and feeding them concentrates³, but given that grazing blocks are often very far away from the yard this is not a feasible solution in most plantations. Others are practicing controlled mating to ensure that birth of calves is outside of the peak rainy season. Further trials need to be done as calf mortality rates are considerably above the set KPIs as can be seen for all SISKA partners in Graph 3.

² Note that cattle did not arrive at the same time in all locations nor is there any uniformity in cattle arriving during dry or wet season. To make comparison easier we have used Year 1 as the first twelve months since arrival, Year 2 as the next twelve months and so on.

³ Refer to costings in SISKA. SUJ is applying this procedure to ensure less mortality but costs have significantly increased.

Graph 3: Calf mortalities – SISKA



Weaning rate – this shows number of calves that can be weaned from their mother and further raised to sell or as replacement herd. Overall weaning rates for SISKA partners in Year 2 were very close to target KPIs averaging between 55 and 60%. Third year figures are too incomplete to draw any conclusions but both BKB (after 9 months) and KAL (after 8 months) seem to be able to achieve their KPI target.

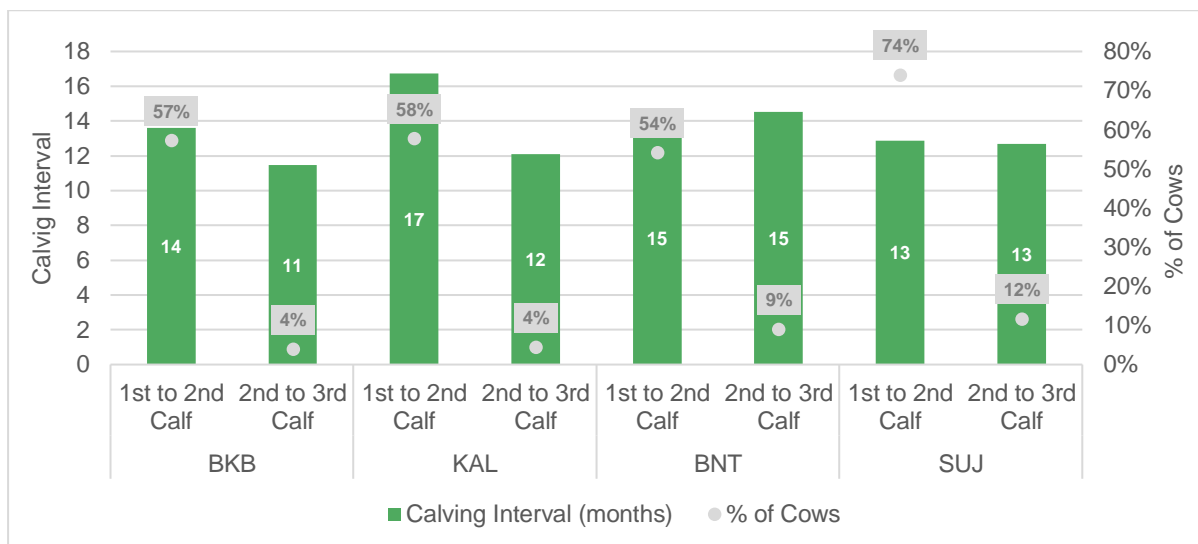
Cow Mortality – is the loss of productive cows during the year which is a good indicator that cattle are well cared for BCS levels are maintained. Loss often occurs through accidents or from complications during calving. Average losses are between 1 and 2 % for all partners over a 2.5-year period and are within the KPI targets.

Weaner/Grower mortalities: Extensive rotating grazing systems will have higher mortality rates than more intensive systems hence KPI target of 5%. Most partners are well within this target except for BKB who lost 8% of their weaner/growers (calves below 100kg) in Year 3. Preliminary explanatory factors include the peak rainy season (as BKB is in the area with the highest rainfall) and secondary causes as pneumonia which went undetected due to the limited oversight in these expansive areas.

Calving Interval, showing the time between subsequent calves, is an indicator of success given a shorter calving interval saves money in feeding the cow. Calving intervals shows significant difference between partners. Originally, each partner tried to achieve calving intervals as short as possible (by early weaning i.e. at an age of 3-4 months and a weight of about 80 kgs), with a target of 12 months. Some partners are now allowing calves to stay longer with the mother before weaning at a weight of around 100kgs⁴. This results in calves that are bigger and more robust and can survive and prosper on grazing and some additional feed. Calving intervals (for about 60% of the herd) variate between 13 and 17 months as shown in Graph 4 which shows the time interval in months between 1st and 2nd calves and 2nd and 3rd calves. Mentioned is also the percentage of cows that achieve this interval.

Graph 4: Calving Intervals – SISKA

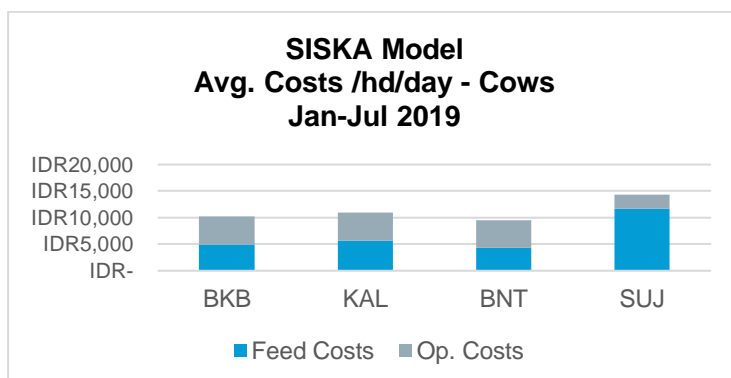
⁴ Preparing the calf for early weaning is done by providing creep feed for the young calves to train them to eat additional concentrate besides grazing. Putting a creep feed system in place in the SISKA model has not succeeded to date as calves follow the mother in an extensive area and do not search for the creep feed locations.



The Economies of the Siska Model

Total costs, that is feed plus operational costs are very similar for three of the four Siska partners at around Rp10,000 (AUD \$ 1 per head) per day. This is within industry standards and will support the economic viability of the enterprise. Lowering the cost, to improve economic viability, can only be done by improving pasture high in nutrition. Compared to other partners, SUJ total costs are higher as they collect and place the pregnant cows (pregnancy >6 months) in the yard instead of grazing to reduce calf mortalities. This increases feed costs significantly.

Graph 5: Average Costs in Siska – Feed and Operational Costs



2. Open Grazing model

IACCB has one partner using this model - CAP in South Kalimantan. Previously this model was called 'Semi-intensive grazing' with the plan of grazing the cattle during the day and keeping them in the cattle yard at night and providing additional feed. Having extensive land area available, CAP's management has decided to expand its area of improved pastures for direct grazing by cattle to reduce costs of feeding concentrate at night. Hence the model name change to 'Open Grazing', which is an extensive system⁵ comparable to the Siska system.

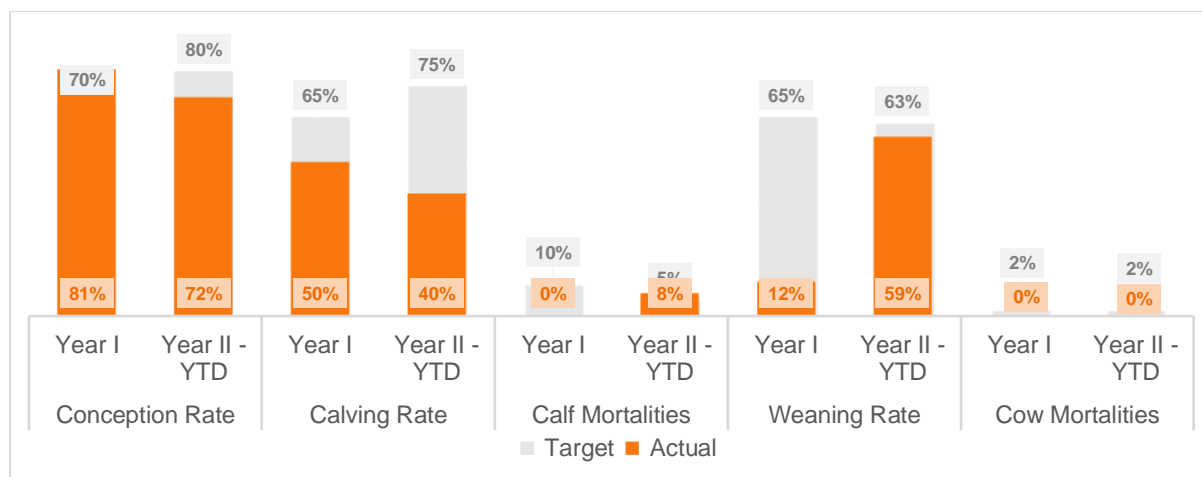
CAP has kept ideal BCS (BCS \geq 2.6) between 80 and 90% of its herd for the first months of 2019. The June figures show that BCS levels have slightly dropped with the majority hovering closely to the ideal figure. Monitoring the levels now that we are entering the dry season is needed to ensure a productive herd. The fact that CAP is only supplying very limited concentrate influences BCS as well as KPIs in calving and weaning. The second year is only finishing end of July but year-to-date (up to June) KPIs are good with conception rate at 72% and weaning rate at 59%, both already close to the KPI target.

⁵ Extensive by Indonesian standards, although would be considered as semi-intensive in Australia because of the relatively high stocking rates.

Calving rates are below target although the KPI is set quite high given the extensive systems have an average of 15 months calving interval (which will extend in time given only 55% of the cows have delivered their calves). More detailed information in Graph 6. Open Grazing KPIs.

Open Grazing is a low-cost extensive breeding model that might be commercially viable, even with lower productivity level compared to other models. Once the two years have been completed the analysis should confirm the above assumption.

Graph 6 Productivity KPIs – Open Grazing



The Economics of the Open Grazing Model

Total costs - feed plus operational costs - in this model is about half that of the Siska projects, with feed costs minimal (as only grazing is applied) and reasonable operational costs. The average daily cost over the last 6 months amounted to only AUD 0.50. This figure is very promising for commercial viability. A CVA will be conducted in September 2019 to collect evidence of the viability.

3. Cut-and-Carry Model

The small-holder cut-and-carry model is an intensive management model traditionally in place in rural Indonesia. Our pilot farmers have considerable experience breeding Bali cattle and PO (Ongole) breeds using traditional models. Scaling-up from a small herd to managing significant numbers of big-framed BX cattle has been something new and challenging for the farmers.

The three partners show following progress:

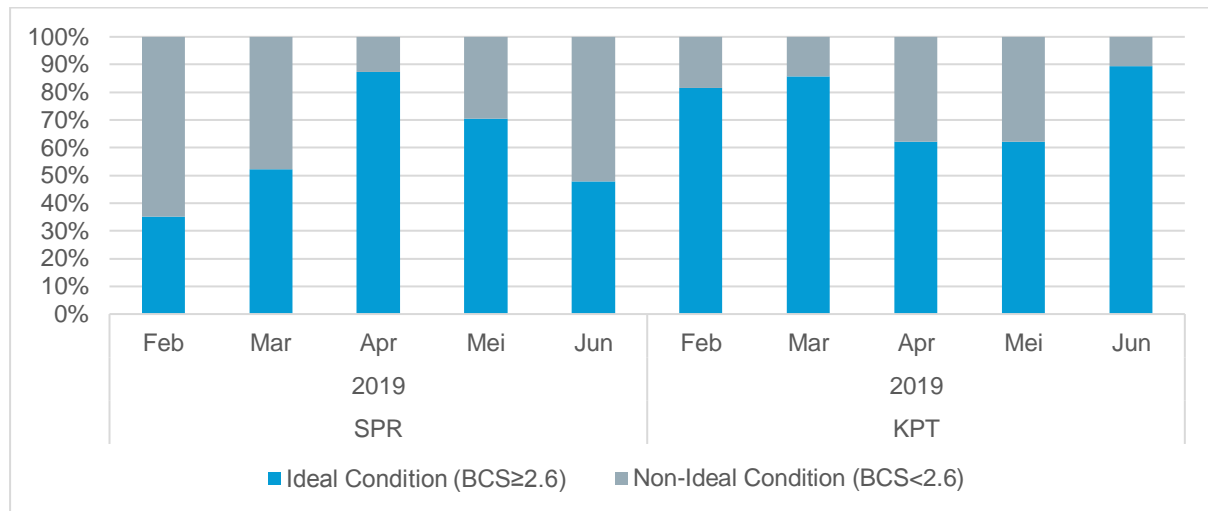
- KPT is a well-organised cooperative experienced in cattle raising and has been able to maintain BCS of its cattle effectively with almost 90% of the cattle showing a BCS around the optimal level of ≥ 2.6 .
- SPR is a farmer group that has struggled to ensure consistency in its feed supply (quantity and quality) mainly because of cash-flow problems. As such we see BCS scores fluctuating and most of the lactating cows scoring around 2.5 or a bit lower which is significantly influencing other KPIs.
- P4S is a new partner who received pregnant cattle in February. All gave birth within 4 months. BCS figures are still good but even there we can see that lactating cows have difficulties maintaining their once excellent BCS with about 20% dropping below preferred BCS score. Other KPIs are not yet relevant for this partner given the pilot only recently started.

The consistency in feed supply, quality and quantity, is extremely important for BCS maintenance and the fluctuation in BCS impacts on other productivity KPIs as conception rate and ADGs.

KPT and SPR are working in similar circumstances but KPT has been able to maintain more consistency in BCS with ideal condition in KPT at 90% but only 48% in SPR (June 2019 figures)

which needs to be addressed given the dry season provides for less green matter at farm level. Refer to Graph 7.

Graph 7: BCS of Small-holder cattle over the last 6 months

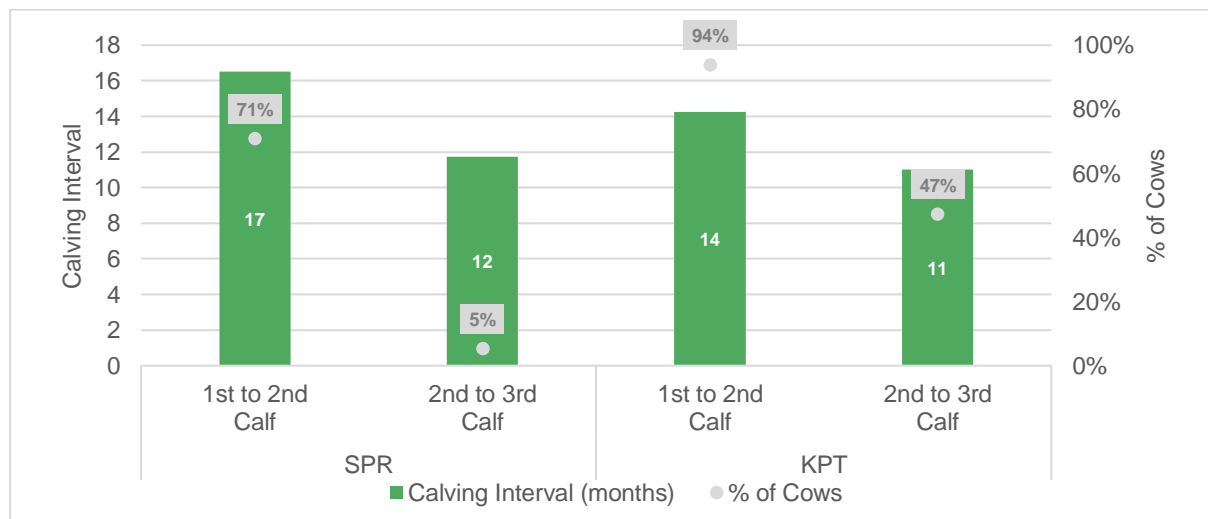


Impact of the fluctuating BCS in SPR and the more stable management in KPT also shows in:

- Conception rates – 95% for KPT vs 73% for SPR (Year 2 figures)
- Calving rates – 94% for KPT vs 51% for SPR (Year 2 figures)
- Weaning rate – for KPT respectively, in Year 1 and Year 2, 87% and 66% for KPT but only 68% and 4%. It shows that growth of the weaners in SPR was slow because of the low weight of the calves born and the low BCS condition of the lactating cows which influences the milk production and hence the weaning of Year 2 calves only occurs in year 3. This delay in SPR adds considerably to the cost of the progeny.
- Cow mortalities are below the KPI target which is as expected as supervision of the cows in an intensive system detects early health problems
- Average calf mortalities for the cut-and-carry partners are equivalent with the KPI target.

Calving intervals are considerably different between KPT and SPR with KPT achieving 14 months for 94% of the cows, against 17 months for SPR and only 71% of the cows. KPI has a fantastic achievement for the interval between 2nd and 3rd calf as 47% of the cows will achieve an interval of only 11 months.

Graph 8: Calving Intervals KPT and SPR



The Economics of the Cut-and-Carry Model

There are significant differences in the total costs between the three partners with total costs varying AUD 1.00 for P4S⁶ and AUD 1.6 for SPR. The most consistent partner, KPT, has expenses of AUD 1.3 which is acceptable even though it is higher than in the SSKA and Open Grazing but the lower calving interval substitutes for the higher costs made. High costs in SPR originated from the fact they had to increase concentrate intake of the cows as BCS levels had dropped.

3.4 Progress Towards End of Program Outcomes

The Program's End of Program Outcomes (EPOO) were defined as follows:

1. Demonstrated Commercial Viability – proving or disproving the three breeding models.
2. Demonstrated increase in interest and investment both with current partners as well as with interested potential investors.

Testing Commercial Viability

Six out of eight partners⁷ have now passed their Commercial Viability Assessment (CVA). CVAs assess commercial sustainability through productivity and commercial parameters, including the Internal Rate of Return (IRR) which is of most interest for new investors. IACCB conducted two CVAs in this reporting period as follows:

1. In March 2019 SUJ was assessed as being potentially commercially sustainable with an IRR of 8.90%. With the added commercial impact from the oil-palm plantation (preliminary figures from one plantation of between 5-12%, the IRR becomes 16.25 %. Early 2020 we will have more definitive data on the fresh fruit bunch production levels influenced by grazing cattle under the oil-palm trees.
2. In April 2019 CAP was assessed as not yet being commercially viable with an IRR of 3.54%. A follow-up assessment will be done in the last quarter of 2019 when figures for the complete second year are available. Since the initial CVA, IACCB has further supported CAP to ensure performance improves and the latest figures in conception and calving rates as well as ADGs show progress over the last three months.

Investors are most interested in (1) IRR and (2) in comparative figures with the Australian imported cattle to assess the commercial viability in terms of getting a return on their money as well as being able to compete with imported cattle.

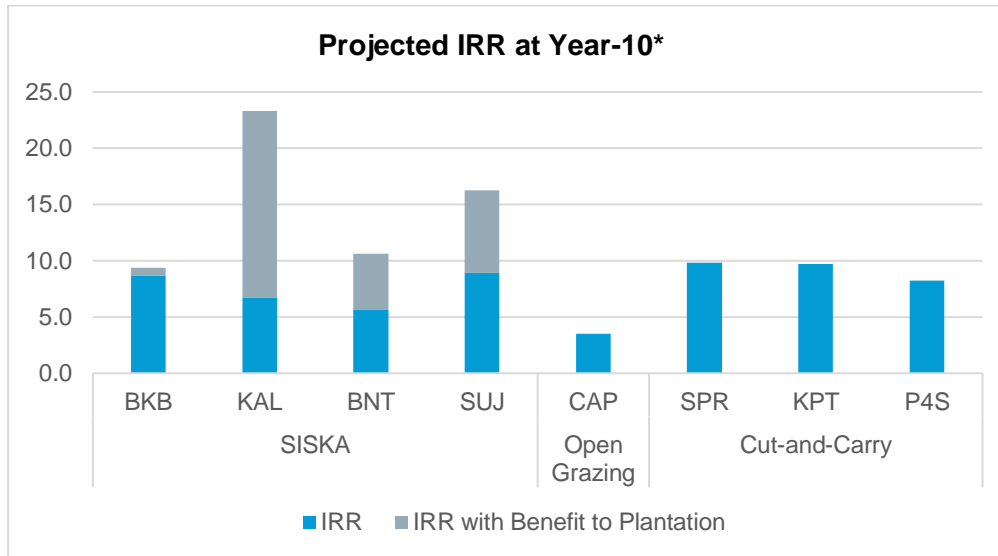
IRR figures provide significant information to make investor decisions in terms of investing their available capital. Graph 9 - shows that almost all partners have IRR between 5-10% at year 10 (without calculating terminal value⁸). In the SSKA Model, if the calculation includes the additional benefits to plantation such as weeding cost reduction or increase in Fresh Fruit Bunch productivity, it is expected that IRR could increase to 15-20%. This increase in FFB will be confirmed through the research collaboration with BPPT.

⁶ Figures for P4S still need to be confirmed as external factors are influencing their data as for instance the livestock agency provided some extra feed concentrates at no cost.

⁷ One partner, P4S, started collaboration with IACCB during this reporting period and will be up for CVA in about 12 months from now.

⁸ Using Terminal Value calculation will also increase IRR as part of that calculation is valuing the assets in place at the end of Year 10. This will be significantly influenced by the value of the herd.

Graph 9: Projected IRR at Year 10

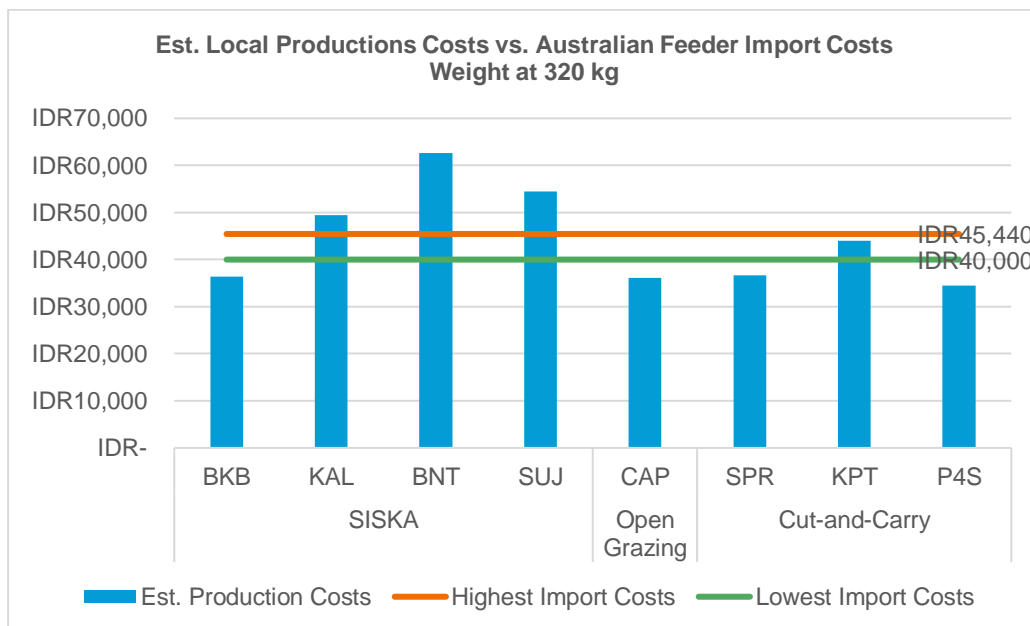


*without calculating terminal value

Graph 10 below shows the comparison of total production cost for all partners compared to the cost of importing feeders from Australia to check competitiveness of breeding BX cattle in Indonesia compared to importing. Preliminary analysis of the production costs, i.e. feed and operational costs, shows that the different models might be able to compete with imported feeder costs. However, as the analysis on the three models above indicates, several parameters still need to be improved to be able to achieve the target KPIs. Critical ones include BCS consistency, calf mortality rate, calving intervals as well as calf and weaner growth.

Another factor is grower ADG, which is one the main contributors to the calculation of these indicative costs. IACCB has been focused on producing weaners and early growers but more efforts need to be done by the partner to ensure optimum growth of weaners which is the profit of the business. A few cost-of-gain trials are currently on-going to provide recommendations for better feed rations based on local materials to increase ADGs which often only reach about 0.3kg/head/day.

Graph 10: Local Production Cost vs Cost of Imported Australian BX Cattle⁹



⁹ The production costs are the indicative costs for locally producing a grower with a weight of 320 kg. These costs consider cow-calf productivity rate (non-conceiving rate, calving interval, mortality rate, ADG etc.) and also include following costs: feed costs, operational costs and depreciation costs. The indicative costs then compare with the Australian imported feeder costs.

Based on the analysis of the KPIs as well as the financial analysis of the models and taking into account the identified challenges and opportunities within the three models some tentative conclusion has emerged as follows:

- **SISKA:** Highest commercial potential but very much dependent on (1) good cattle and plantation integration (2), high quality and consistent herd management, (3) adequate cash-flow to support the ongoing needs of the cattle business, and (4) pasture development to ensure enough quality and quantity of feed, complemented by using palm oil waste products. Commercial viability is reflected in three out of the four SISKA-partners investing to significantly expand their cattle breeding businesses. Preliminary research results put savings in weed control at 9\$/ha/year and showed oil palm productivity improvement in one plantation at 5 to 12%, which bides very well for SISKA commercial viability.
- **Small-holder Cut-and-Carry:** Partners have shown that strong conception, calving and weaning rates and short calving intervals as well as reasonable growth rates can be achieved under a Small-holder Cut-and-Carry model. But on the other hand, Communal BX (and other) smallholder cattle breeding projects will find it very challenging to sustainably achieve commercial viability in a communal system given the challenges of the system itself. Communal breeding systems practiced by farmer groups are rare, except where the communal model is a necessity and is locally and socially accepted - providing collective security for the cattle. Critical factors to the communal system include cohesion of the group/cooperative, solid leadership and transparent management; cash-flow and member and leadership cattle breeding experience.
- **Open grazing:** This model requires the least starting capital, and daily expenses per head, compared to other models. Sustainable commercial viability appears to be dependent on good management, pasture quality improvement, and the comparative advantage of using the available land for cattle breeding compared to other investment alternatives.

Increase in Interest and Investment

Partners' Increase Investment: The increase in herd numbers of 75% from those granted by IACCB has been followed by additional partner investment in form of facilities, infrastructure, and other operational investments. Three out of the four SISKA partners have plans to expand their herd with the view to improving economies of scale (optimise labor versus the size of the herds)¹⁰. Total investment plans are not yet available to IACCB but our financial planning tool CALFIN is supporting the estimates.

- BKB is adding is adding another 300 heifers to their herd in 2020 and aiming to establish the cattle enterprise as a separate business unit by 2020, including serving as a SISKA Centre Of Excellence providing commercial training and cattle fattening services.
- SUJ is expanding their herd with the progeny of BX and local cattle up to a herd of 800 from an original herd of 200 BX cattle. They are also expanding their cattle business specifically in fattening and have arranged for their import license, so they are able to import BX cattle themselves. During the reporting period 117 local pregnant heifers were added to the herd.
- KAL, whose joint venture management has decided not to add fresh cash to the enterprise is expanding its business to fattening using the rejected heifers and the bulls. A trial of 40 cattle is in place with Average Daily Gain results currently around 0.7kg/head/day. Final weighing around Idul Adha/Qorban festival will provide final figures.

Partner Investment totals IDR 27,852,827,341 or about AUD 2,800,000 based on the data from the monthly report submitted by the partners (46% of the total project investment). See Annex 8. Partner Profiles.

New investor interest: Interest is shown by potential investors contacting IACCB as documented in Annex 9. One very interesting and potential ground-breaking evolution in SISKA is the increased interest

¹⁰ The total herd is split into separate groups of different cattle categories (cows, weaners, growers) who are grazed in different blocks each needing cattlemen, water supply, electric fencing and others. By increasing the number of cattle in each category there is an optimization of costs.

of government which has a number of State-owned oil-palm plantations which have done significant investment in SSKA in the past but all failed. The main research institute supporting the state-owned oil-palm plantations is the *Pusat Penelitian Kelapa Sawit* in Medan (Oil Palm Research Center). PPKS is inviting our partner BKB to present their experiences in SSKA to an extensive field of practitioners in the oil-palm sector to be able to build on the lessons learnt of a successful SSKA-operation.

4 Management and Operational Systems

4.1 Personnel

Towards the end of the IACCB Phase 1 the Team leader, Dick Slaney, left the program. The new Team Leader, Paul Boon, commenced in February 2019. The M&E Assistant, employed part-time since February 2018, was moved to full-time, providing the M&E manager with more time for data analysis. Towards the reporting period an Investment Manager, Robi Agustiar, resigned and budget restrictions did not allow for his replacement.

4.2 GESI

During the reporting period IACCB actively encouraged partners to employ women in both field, management and administrative roles. The nature of the work (cattle breeding), and the remote location of most partners far away from towns has however been a significant disincentive for women to apply for long-term positions.

Partners have been encouraged to ensure the participation of women in capacity-building activities. Refer to Annex 5. Besides that partners are encouraged to hire more women in their companies and organisations. Refer to Annex 10.

Our service provider Gita Pertiwi is encouraging the small-holders to ensure that in job descriptions, contracts and employee benefits gender specific issues are taken into account. IACCB recently allocated more time to Gita Pertiwi to increase awareness on gender issues as well as on the involvement of youth in the cattle business.

4.3 Risk Management and Mitigation

An updated Risk Management Plan is provided in Annex 11. Current, often on-going, risks are linked to the long-term nature of cattle breeding.

Partner Management, both in companies and small-holder groups, reduced commitment to achieve their enterprise's commercial potential because of the long negative cash-flow period that needs to be covered most probably up to Year 3 or Year 4 depending on the strategy of sales of weaners i.e. selling them quickly to support cash-flow but with less profit or raising the weaners up to 200kg or more which provides more profit. Mitigating such a risk is done by holding regular meetings with motivating activities, including the communication of positive commercial data, the timely solution of technical issues, and workshops where management learn from other companies, including solutions to seemingly intractable problems.

Availability of green fodder is a remaining problem to ensure quality and quantity supply of feed at a low cost. Partners have invested in pasture development and green fodder availability has significantly increased compared to previous year. But the supply of green fodder is insufficient in the dry season which results in the need for supplementation with high cost concentrate which put further stress on the enterprise budget.

Some Government policies dim the enthusiasm of potential investors as profit margins in the wider sector remain limited over an extended period of time. Live beef prices hit a bottom price of only AUD 3.8/kg live weight.

5 Budget and Expenditures

The following Table 5 summarises budgeted vs actual expenditures (Program to date, Financial Year and Program Year 4 to date). Details are provided in Annex 12.

Year 4 was the start of the no-cost extension and the 'head budget variance' shows the variance against the total budget as agreed early on in the Program.

The financial year variance amounted to -3.6% because of small underspent in STAs including on communications where we are working with ASG. Some to July deferred payment also adds to the variance.

6 Planned Activities August 2019 – January 2020

Main activities over the following six months include:

Promoting of IACCB results in SISKA including through:

- Presenting at the 11th Asian Sustainable Oil Palm Summit in Jakarta on 12-13 September 2019.
- Organising the Integrated Cattle and Oil-Palm Conference (ICOP 2019) in collaboration with the Indonesian Agency for the Assessment and Application of Technology (*BPPT*). The ICOP Conference will be held on October 23rd in Jakarta with involvement of investors from Malaysia and Papua New Guinea and will include the launching of the modules and the investor tools developed by IACCB and industry members.
- Two Quarterly Updates focusing on the analysis of the commercial viability of the SISKA, the open grazing and the cut-and-carry smallholder models.

Carrying-out Partner Progress Assessments (PPAs) with all partners is planned to assess productivity performance and sustainability of the economic viability and to provide recommendations for technical and management improvements.

Phasing-out of the original two cut-and-carry small-holder partners, SPR and KPT, as data collection over a two-year period has provided a sufficient data-base to be able to conclusively draw lessons on the model.

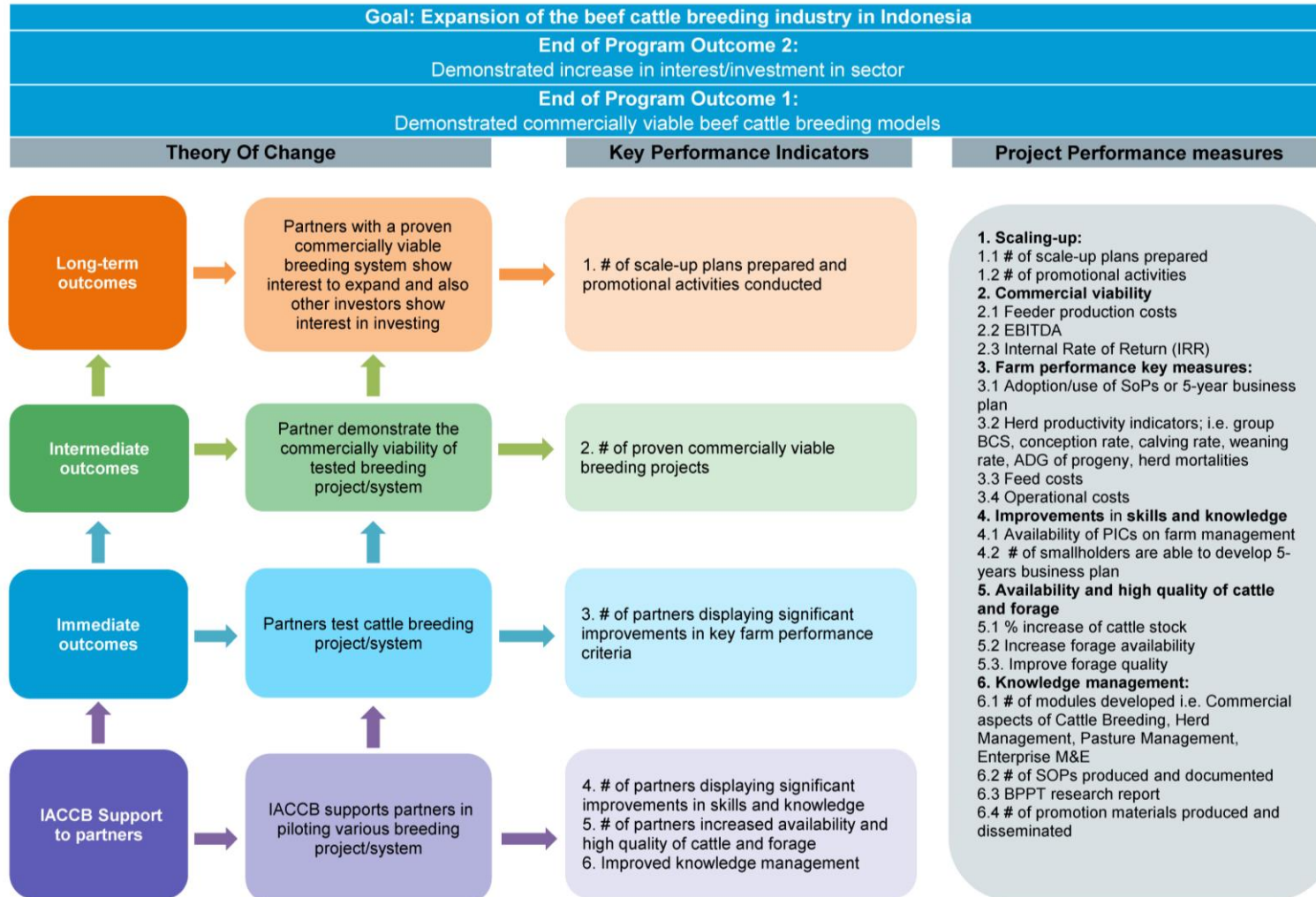
Implementing the plan to phase-out from BNT, one of the SISKA-partners, who is in financial difficulties and will focus on the palm-oil core business while selling off the other enterprises linked to the agricultural waste-products including the cattle business.

Planning for the phase-out of the remaining three SISKA-partners where breeding model assessment will benefit from the minimal 2.5 to 3-year data collection which will provide solid data for this model which is seen as the most potential model for investment.

Planning for the phase-out of the 'Open Grazing' partner at the end of their 2-year pilot. The option of extending data-collection for another 6 months is still open and needs to be weighed against the budget availability and the necessary IACCB inputs required.

Annex 1

IACCB Theory of Change & Key Performance Indicators & Project Performance Measures



Annex 2

Culled Cattle Sales and Refunds

Cattle culls since IACCB commencement

No	Project/Partner	Heifer		Bulls		Sales price	Total Cost	Refund to IACCB
		Culled	Dead	Culled	Dead			
1	BKB	12	15	4	1	155,386,500	45,761,861	109,624,639
2	KAL	17	9	3	1	312,704,000	8,197,985	43,266,015
3	BNT	21	3	1	3	202,628,000	39,061,621	72,434,379
4	SPR	27	-	1	-	289,959,000	156,068,502	127,890,498
5	SUJ	22	2	-	-	320,373,000	120,212,950	195,659,350
6	KPT	1	1	-	-	6,976,000	1,875,000	5,101,000
7	CAP	10	-	5	1	248,647,000	19,719,351	92,957,649
Total		110	30	14	6	1,536,673,500	390,897,270	646,933,530

Culled cattle sales and monies refunded to IACCB – February to July 2019

No	Project/Partner	Heifer	Bulls	Sales price	Total Cost	Refund to IACCB
		Culled	Culled			
1	BKB	-	-	-	-	-
2	KAL	-	-	-	-	-
3	BNT	-	-	-	-	-
4	SPR	-	-	-	-	-
5	SUJ	-	-	-	-	-
6	KPT	-	-	-	-	-
7	CAP	1	5	112,677,000	19,719,351	92,957,649
Total		1	5	112,677,000	19,719,351	92,957,649

Annex 3

Industry Tools for Planning and Monitoring a Cattle Breeding Enterprise

CALFIN: Cow-calf Operations Financial Planning Model



CALFIN is an enterprise level financial model to support cattle breeding investors in their decision making. The Microsoft Excel-based model will be valuable for oil palm companies, feed-lotters, breed-lotters and smallholder groups as well as banks, financial institutions, donor and government agencies. The model has considerable flexibility in its parameters, covering investment costs, the breeding system used, herd size and performance, operational and feed costs, and all production and marketing parameters. There are two versions of the model: 1) a static version, that uses standard input variables across the entire prediction cycle; and 2) a dynamic version, for which variables can be changed for each year. The spreadsheet provides the minimum level of complexity required to undertake an informed assessment of commercial viability. It determines production over a 10-year period to generate a series of reports including: cash flow, net present value, internal rate of return, return on investment and payback period.

Default Data is also included based on IACCB's experience to date, allowing users to get started without possessing their own data for some or all parameters.

CALPROS: Cow-calf Operations Productivity Spreadsheet for Monitoring

IACCB developed CALPROS as a tool for cattle breeding businesses to monitor the productivity of breeders and their progeny. The CALPROS spreadsheet is based on Microsoft Excel and can be used by new actors in the cattle breeding industry. It is specifically developed for new enterprises to ensure they are able to monitor their operations without having to buy expensive software thus reducing start-up investment costs at the start of their enterprises.



CALPROF: Cow-calf Operations Software



Developed by PT. Utama Niaga Informasi (UNI), CALPROF is a robust cattle herd management software for Indonesian Cattle Breeders that support day-to-day cattle operations, specifically breeding, fattening, and feeding. The software has integrated features that manage productivity (e.g. pregnancy tests, weighing, calving) linked to a Radio-frequency identification (RFID) reader, financial (e.g. feed costs, cashflow), and operational data (e.g. shipments, procurement, feed intake and nutrition, concentrate formulation and production, animal health, cattle movement). The software also generates reports that can support cattle breeders to monitor and evaluate their business performance.

Annex 4

STA Training activities – 2019

Trainer	Partner	Subject	Date
Ross Ainsworth	BKB & CAP	Animal Welfare & Animal Health training	9-11 Apr-19
	SPR	Animal Welfare & Animal Health training	12-14 Apr-19
	KAL & P4S	Animal Welfare & Animal Health training	15-16 Apr-19
	BNT	Animal Welfare & Animal Health training	22-24 Apr-19
	SUJ – Nakau	Animal Welfare & Animal Health training	25-26 Apr-19
	SUJ – Nakau	Pregnancy Test & Cattle Observation	26-27 Jun-19
	KPT	Pregnancy Test & Cattle Observation	28 Jun-19
	BNT	Pregnancy Test & Cattle Observation (BCS)	29-30 Jun-19
	KAL	Pregnancy Test & Animal Health Reproduction Training	2-3 Jul-19
	P4S	Pregnancy Test & Animal Health Reproduction Training	4 Jul-19
	CAP	Pregnancy Test, Grower Selection & Animal Health Training	15-16 Jul-19
	BKB	Pregnancy Test, Grower Selection & Animal Health Training	17-18 Jul-19
Donald Nuske	KAL	Pasture Assessment	25 Feb-19
	BNT	Pasture Assessment	26 Feb-19
	SUJ – Nakau	Pasture Assessment	27 Feb-19
	CAP	Permanent Fence Assignment	26 Apr – 2 May-19
	SUJ	Pasture Assessment	25-26 Jun-19
Ben Mullen	KAL	Pasture Assessment	25 Feb-19
	BNT	Pasture Assessment	26 Feb-19
	SUJ – Nakau	Pasture Assessment	27 Feb-19
	BKB	Telecon with BKB	1 Mar-19
	SUJ	Feed Trial Protocol, Cattle Mobs & Basic Training for Cattle Nutrient and Pasture	28-29 Mar-19
	KPT	Cattle Mobs, Ration/Concentrate Eval. & Basic Training for Cattle Nutrient and Pasture	28-29 Mar-19
Ben Mullen	CAP	Cattle Mobs, Pasture Development & Infrastructures Development	1-3 Apr-19
	BPPT	Method of Study Discussion	4 Apr-19
	BNT	Feed Trial Protocol, Cattle Sales Prog, Pasture Strategy	5-6 Apr-19
	BNT	Pasture by flood affect & ration recommendation	22 Jun-19
	SUJ – Nakau	Assess Progress of Trial	23 Jun-19
	KPT	Assess Impact of Change Rations	24 Jun-19

Annex 5

Partner Training Activity Participants

Partners	Types of Training	Participants		
		Female	Male	Subtotal
BKB	Animal Welfare, Animal Health, Herd Recording	0	9	9
KAL	Animal Welfare, Animal Health	1	4	5
BNT	Animal Welfare, Animal Health, Nutrition, Software, Pregnancy test	2	10	12
SPR MJ	Smallholder workshop, herd recording	2	3	5
KPT MS	Animal Welfare, Animal Health, Smallholder workshop, Herd Recording	0	20	20
SUJ	Animal Welfare, Animal Health, Nutrition, Software, Pregnancy test	0	18	18
CAP	Animal Welfare, Animal Health, Smallholder Workshop	1	3	4
P4S	Animal Welfare, Animal Health, Herd Recording	0	4	4
Total Participants (in numbers)		6	71	77
Total Participants (in percentage)		8%	92%	100%

Annex 6

IACCB Outreach to Government and Industry

Date	Key Person	Institution	Subject
February 2019	RCMP Board co-chairs	DAWR and BKPM	Presenting IACCB experience to investor round-table in Melbourne during the Partnership Board Meeting
April 2019	MoA Secretary-general - Mr. Syukur Iwantoro, MBA	MoA	Report on IACCB progress (activities Phase 1 2016 to 2019 and Phase 2 2019 to 2021) and update on new partner P4S
	MoA Director of Animal Health in DGLivestock – Mr. drh. Fadjar STR Phd	MoA	Provide update on IACCB activities and more specifically on SSKA opportunities and challenges
	Mr. William Bullo and team	PT. Juang Jaya Abdi Alam	Discussing the potential prospects for cattle breeding at PT JJAA
May 2019	MoA Head of Agriculture Training Center – Mr. Ir. Bustanul Arifin Caya Syukur MDM	MoA	Discussing potential collaboration in training activities including through P4S Karya Baru Mandiri in Central Kalimantan
	MoA Director of Feed in DGLivestock – Mrs. Ir. Rr. Sri Widayati, MM	MoA	Discuss IACCB activities specifically for integration of cattle in oil-palm, activities of IACCB partners (PT Buana Karya Bhakti)
	South Sulawesi Provincial Government cq Deputy of Governor	South Sulawesi Government and Local Private Sector Stakeholders	Investment Roundtable on Red Meat and Cattle Production
	Deputy Head of Division – Mrs Eka Puspita Sari	BRI Agro	CALFIN presentation and gauging interest from BRI Agro in using this instrument to assess potential customer in SSKA Model
June 2019	Executive Secretary of GAPKI – Mr. Ir. Mukti Sardjono, M.Sc	GAPKI – Palm Oil Producers Association	Discuss the possibility of the IACCB participating in the International Palm Oil Conference (IPOC) October 31 - November 2, 2019 in Bali and updating on IACCB activities related to the integration of cattle breeding in oil-palm plantations on a commercial scale.
July 2019	MoA Director of Breeding and Livestock Production in DGLivestock – Mr. Ir. Sugiono MP	MoA	Discuss updates on IACCBP activities up to June 2019 with a specific focus on the small-holders and informing about the plan for the SSKA International Conference in October 2019 in Jakarta and the workshop of IACCB smallholder partners in early 2020.

Annex 7

Summary of Partner Progress

- ✓ **Buana Karya Bhakti (BKB) - SISKa model.** Since obtaining cattle 33 months ago BKB has shown that plantation and livestock activities are compatible and constitute a key-success factor reflected in good herd performance. As mentioned above, BKB is expanding its herd through two strategies i.e. progeny selection and additional investment acquiring heifers from suppliers. BKB is adding 30 pregnant heifers in 2019, targeting a total herd of 750 by the end of 2019, while adding another 300 heifers to their herd in 2020. BKB has started to fatten rejected heifers and bulls from their herd as their new PKC mill provides waste products of the palm-oil production process at a relatively cheap price which will make fattening viable.
- ✓ **Kalteng Andinipalma Lestari (KAL) - SISKa model.** KAL, a joint venture between a plantation and a feedlot owner, has previous (unsuccessful) experience in cattle breeding and started the BX-trial 32 months ago. Progress has been made in managing the integrated plantation and cattle business and KAL is expanding their livestock activities into fattening by opening a feedlot of 25 heifers and bulls not selected for further breeding. Herd expansion is implemented through selecting heifers from year 1 progeny.
- ✓ **Bio Nusantara Teknologi (BNT) - SISKa model.** The 30-month old cattle breeding enterprise in BNT remains being implemented in a challenging context of balancing social issues (interaction of the plantation with surrounding villages and their cattle entering the plantation) with plantation productivity issues in a relatively old plantation which suffers from reduced harvest and a market price slump for palm oil. Besides this, BNT recently experienced heavy flooding with loss of infrastructure and facilities. No cattle were lost but the condition of flooded areas in the plantation (pasture covered with mud) put heavy strain on the productivity KPIs of the breeding cattle. Just before finishing this report BNT decided to solely focus on the core business of palm oil production and cease all secondary enterprises including their cattle breeding activities.
- ✓ **Sentra Peternakan Rakyat Mega Jaya (SPR-MJ) – Small-holder Cut-and-Carry model.** Bojonegoro's SPR-MJ 30-month experience in BX cattle breeding is not unique for small-holders as it has suffered from the challenges of communal enterprises and especially the cash-flow issues associated with more intensive livestock enterprises. Although having passed their CVA, IACCB decided not to hand-over the cattle yet due to concerns about the capability of SPR-MJ of maintaining the herd condition. Tri-partite meetings between the local livestock agency, SPR-MJ and IACCB were held to discuss solutions and agree on the road forward especially on how to improve the BCS of the herd ensuring higher productivity KPIs. Besides technical issues IACCB provided support through Gita Pertiwi to support their business skills development and develop their business plan. The condition of the herd has considerably improved, transparency in managing the farmers group especially finances has instilled some new enthusiasm in the group and a phase-out strategy is being discussed.
- ✓ **Koperasi Produksi Ternak Maju Sejahtera (KPT MS) – Small-holder Cut-and-Carry model.** The 27-month experience in BX cattle breeding and IACCB support has provided useful skills and knowledge to the group. The project has achieved exceptional conception rates for the second pregnancy and proven that low calving interval are possible with small-holders. 10% of the cows became pregnant in less than 3 months after calving. Although productivity KPIs are impressive IACCB decided not to hand-over the cattle at the start of Phase 2 given some emerging cash-flow problems and the request from KPT members to stop using communal pen but split the herd in 6 distinctly located pens which brings complexity to monitoring. The past 6 months have proven that KPT MS is capable of maintain their herd and a phase-out strategy has been discussed and agreed between IACCB and KPT MS.
- ✓ **Superindo Utama Jaya (SUJ) - SISKa model.** Although barely 2 years into their BX breeding project, SUJ has shown that strong leadership commitment as well as a guaranteed cash-flow is key for a successful business. SUJ completed their 2nd CVA resulting in being assessed as

“Potential Commercially Viable”. Management is demonstrating their strong commitment in reducing the calf mortalities in one facility, the breedlot in Metro, and improving pasture development as well as feed quality in the plantation in Nakau. SUJ is trialing the herd management software (CALPROF) and is growing their herd size. During the CVA, early 2019, the herd size target to be achieved within 5 years was around 800. Recent management decisions target an expansion of their herd to a total of 2,500 cows consisting of 2,000 BX heifers and 500 selected heifers from their own herd within the next 2.5 years. SUJ and IACCB are conducting a feed trial for weaners to provide evidence that improved feed composition can result in better performance. Results will be available in September 2019.

- ✓ **Cahaya Abadi Petani (CAP) - Open grazing model.** July 2019 will mark CAP’s 2-year anniversary in BX breeding and KPI achievements will be comparable to SISKKA, the other extensive breeding model. The 18th month CVA concluded that CAP needs to improve the condition of the cows to ensure higher conception and calving rates. Weaner development and growth can be substantially increased by ensuring weaners can graze quality pasture and have access to some concentrate especially just after weaning. CAP has invested in permanent fencing and in expansion of the pasture. Recent conception rate data show 72%.
- ✓ **Pusat Pelatihan Pertanian dan Perdesaan Swadaya Karya Baru Mandiri (P4S KBM) – Small-holder Cut-and-Carry model.** The collaboration started in February 2019 with the safe delivery of 20 pregnant heifers. Up to June 2019, all cows have calved but some lactating cows started to lose body condition. IACCB is analysing the data to ensure enough quantity and quality feed is provided given the higher demand during lactation. Six calves have been weaned and it is expected that some of the mothers are pregnant already. Due attention needs to be given to P4S KBM in terms of record keeping, timely data provision, consistently handling of cattle according to the agreed SOPs and ensuring the availability of staff assigned to the tasks.

Annex 8

Partner Profile Summary

	Partner	Breeding System	Province	Cattle delivered			IACCB & Partner Investment ¹¹ (AUD)			MoU signed ¹²
				Received cattle ¹³	Number	Total	IACCB	Partner	Total	
1	Buana Karya Bhakti (BKB)	1. SSKA	South Kalimantan	Oct '16	300 Heifers	300 Heifers 20 Bulls	673,022 (54%)	572,678 (46%)	1,245,700	16 Aug '16
				Dec '16	12 Local Bulls					
				Jan '17	8 Imported Bulls					
2	Kalteng Andinipalma Lestari (KAL)	1. SSKA	Central Kalimantan	Nov '16	200 Heifers	250 Heifers 15 Bulls	625,099 (59%)	426,405 (41%)	1,051,504	31 Oct '16
				Dec '16	9 Local Bulls					
				Feb '17	50 Heifers 6 Imported Bulls					
3	Bio Nusantara Teknologi (BNT)	1. SSKA	Bengkulu	Jan '17	246 Heifers	246 Heifers 13 Bulls	584,498 (49%)	599,205 (51%)	1,183,704	1 Nov '17
					13 Imported Bulls					
4	Sentra Peternakan Rakyat - Mega Jaya (SPR MJ)	3. Cut and carry	East Java	Jan '17	100 Heifers	100 Heifers 4 Bulls	247,389 (62%)	153,214 (38%)	400,704	10 Jan '17
					3 Imported Bulls					

¹¹ The \$ amounts indicate the total investment to date by both parties over the life of the project as per the feasibility assessment. This includes cattle, infrastructure, fixed and variable costs and a number of estimates including lease of land etc.

¹² MoUs have been extended with 7 out of the 8 original partners while collaboration with TVJ was ceased due to technical difficulties in the ranch site. Partner number 9 is a new partner added in February 2019.

¹³ Marks project commencement, which is calculated from the time partners receive their cattle.

	Partner	Breeding System	Province	Cattle delivered			IACCB & Partner Investment ¹¹ (AUD)			MoU signed ¹²
				Received cattle ¹³	Number	Total	IACCB	Partner	Total	
				Apr '17	1 Imported Bulls					
5	Koperasi Produksi Ternak Maju Sejahtera (KPT MS)	3. Cut and carry	Lampung	Apr '17	100 Heifers 5 Imported Bulls 3 calves	100 Heifers 5 Bulls 3 Calves	247,260 (58%)	180,718 (42%)	427,978	12 Apr '17
6	Superindo Utama Jaya (SUJ)	1.SISKA/ Breedlot	Lampung	Apr '17	196 Heifers 10 Imported Bulls	196 Heifers 10 Bulls	459,134 (41%)	652,863 (59%)	1,111,996	24 Apr '17
7	Tugu Vanilla Jaya (TVJ)	2.Open grazing	NTB	Technical Assistance Only			18,949 (26%)	55,000 (74%)	73,949	2 May '17
8	Cahaya Abadi Petani (CAP)	2.Open grazing	South Kalimantan	Aug '17	103 Heifers	103 Heifers 8 Bulls	344,855 (66%)	173,745 (34%)	518,600	3 Jul '17
9	Pusat Pelatihan Pertanian dan Perdesaan Swadaya Karya Baru Mandiri (P4S)	3.Cut and Carry	Central Kalimantan	Feb '19	20 Heifers 1 Bull	20 Heifers 1 Bull	71,814 (73%)	26,355 (27%)	98,168	7 Nov '19
Cattle delivered in this reporting Period				20 Heifers and 1 Bull					60,020	
All cattle delivered since Program commencement				1,315 Heifers, 114 Bulls - Total 1,429 Cattle			3,253,071	2,785,283	6,038,354	

Annex 9

Potential Investor Interest

Company	Location	Date	Key Points of the conversation
PT. Juang Jaya Abdi Alam	Lampung	April 2019	<p>PT JJAA has a long-standing relationship with IACCB and is interested to learn from IACCB experiences in BX cattle breeding.</p> <p>PTJJAA hopes IACCBP can share a comprehensive comparison of breeding systems in Indonesia including challenges and outcomes to serve as a reference for future investment decisions.</p>
PT. Tri Patra Agri Persada	Central Kalimantan	May 2019	BRI Agro customer who have informed BRI about their interest in investing in SSKA
PT. Mulia Sawit Agro Lestari	Lampung	July 2019	Interest to attend The Conference on Integrated Cattle and Oil Palm Production (IC-ICOP) 2019 to obtain information on SSKA investment.
PT. Citra Alam Semesta	Jambi	July 2019	Interest to attend The Conference on Integrated Cattle and Oil Palm Production (IC-ICOP) 2019 to obtain information on SSKA investment.
PPKS: Pusat Penelitian Kelapa Sawit Medan/Oil Palm Research Center	Medan	July 2019	PPKS is inviting BKB to present their experiences in SSKA. Participants will include the State-owned government plantations that previously trialled SSKA but failed.

Annex 10

Women Participation in Partner Enterprises

Partner	Number	Remarks
BKB	6	Daily worker for pasture development activities
KAL	12	1 person in admin role, 10 persons for pasture development, 1 person as cleaning service
BNT	28	2 persons at management level, 1 person as office administration, and 25 others are now involved in collecting oil palm leaves for cattle feed and pasture development
SPR	6	1 person in management level, 4 persons for cutting the forage/grass, and 1 person for cleaning up the cattle yard
KPT	4	1 person for taking care of the calves and 3 persons for feeding the cattle and pen cleaning
SUJ	5	2 persons as office administration in Grenjeng and 3 persons for pasture development activities in Nakau
CAP	7	1 person in administration and 6 persons for pasture development activities

Annex 11

Risk Management Plan

Legend:

- L – likelihood, C – Consequence, R – Risk
- 1 lowest, 5 highest (Risk: Low, Medium, High)

Risk	Impact	Probability			Risk mitigation approach	Entity Responsible
		L	C	R		
Political Risks						
Indonesia maintains a policy of capping the Jakarta market beef price with IBM	Interest in investment in breeding cattle enterprises is greatly reduced	5	5	H	Support partners develop efficient cattle herd production models to optimise profit. Red Meat and Cattle Partnership supports promoting the fact that cattle breeding can be profitable and beef remain affordable – if cheap imports are controlled	IACCB Red Meat and Cattle Partnership
Macro – Institutional Risks						
Slowdown in investment in Indonesia due to the continual change of the regulatory framework	Investors driven away from the industry. The program completes without continuation and scaling up of breeding projects is coming to a halt.	4	4	H	Each project will strive for optimum efficiencies across pasture and herd management, allowing the business to more successfully confront external risks Communicate the impact of policy uncertainty on attracting investment to GOI.	IACCB Red Meat and Cattle Partnership
Lack of partner capacity and poor uptake of technology	Poor treatment of animals and poor outcomes for the herd with low level profitability	3	4	M	IACCB team to continue to enforce adoption of herd management practices. Provision of high-quality technical	IACCB

Risk	Impact	Probability			Risk mitigation approach	Entity Responsible
		L	C	R		
					assistance, training mentoring and support.	
Management practices do not reach industry standards resulting in inefficient and ineffective management	Enterprises suffering and not being able to proof commercial viability.	4	4	H	IACCB to keep convincing (through PPAs) that management practices need to be optimised to achieve KPIs that support commercial viability.	
Financial Risks and Operational Challenges						
Low IRR – cost of capital exceeding returns within the 5-year program time frame	Failed investment	3	4	H	Provide high quality advice on reducing costs whilst maximising profitability	IACCB
Unable to establish a year-round viable feed supply due to cash-flow problems	Poor calving rates and long calving intervals, low production – unprofitable outcomes	3	4	M	Increase efforts to establish better pastures and fodder conservation methods	IACCB
Organisational Risks						
Small-holder organisations suffer cohesion and unity resulting in reduced ownership sense.	Commercial viability at risk as cash-flow and commitment to manage cattle properly is lacking	3	4	M	Working very closely with partners to improve transparency and accountability in the group and to clarify ownership of cattle.	IACCB and GP

