

## ISPC Assessment of the Livestock Agri-Food System (LIVESTOCK) CRP-II revised proposal (2017-2022)

**ISPC CRP RATING<sup>1</sup>: B+**

### 1. Summary

- CRP LIVESTOCK provides research-based solutions to drive the transition of smallholder farmers, pastoralists, and agro-pastoralists to sustainable, resilient livelihoods and productive small-scale enterprises that will help feed future generations. The research spans multiple commodities: cattle (milk and dual-purpose milk-beef), poultry (eggs and meat), pigs, sheep and goats. LIVESTOCK aims to assist 4.13 million people exit poverty; 6.5 million households adopt improved feeding options and strategies, integrated herd health packages, and/or genetically improved livestock; 11.5 million people meet minimum dietary energy requirements; restoration of 13.69 million ha of degraded land; and reduction of agriculture-related GHG emissions by 0.08 Gt CO<sub>2</sub>eq/yr<sup>2</sup>.
- The CRP makes a credible case regarding multiple links and pathways between livestock-related research and grand challenges in the SRF, in particular the close links between livestock systems and GHG emissions, climate-related resilience, water use, nutrition, and food safety.
- The CRP has demonstrated its strong commitment to participate fully in the site integration plans that have been developed. The locations seem well-suited for the anticipated program of research, and eight out of the nine value chain research hubs overlap with new site integration countries.
- The CRP's premise is that increased productivity and growth in the smallholder livestock sector will meet the increasing demand for animal-source foods in developing countries, including in urban areas. The proposal does not, however, adequately recognize the transformations away from the smallholder sector which are already occurring in the livestock sector in some countries.
- The CRP is organized around Genetics, Animal Health, Feeds and Forages, Livestock and the Environment and Livelihoods. While there is some potential for improving productivity of indigenous stock through breeding, health packages and improved feeds, the expectations on delivery are not supported by evidence of past success.
- This is a new CRP but with the same leader as the Phase 1 Livestock and Fish CRP. The Phase 2 CRP has a much stronger technology focus than CRP L&F.
- The proposal envisions productive and close relationships with integrating CRPs i.e., A4NH (co-lead on human health related aspects), CCAFS (co-investment in emissions work, climate policy), and WLE (targeting water use efficiency, land degradation and restoration). The CRP has improved its connections to other AFS CRPs.

<sup>1</sup> A+: Outstanding - of the highest quality, at the forefront of research in the field (fully evolved, exceeds expectations; recommended unconditionally).

A: Excellent – high quality research and a strongly compelling proposal that is at an advanced stage of evolution as a CRP, with strong leadership which can be relied on to continue making improvements.

A-: Very good – a sound and compelling proposal displaying high quality research and drawing on established areas of strength, which could benefit from a more forward-looking vision.

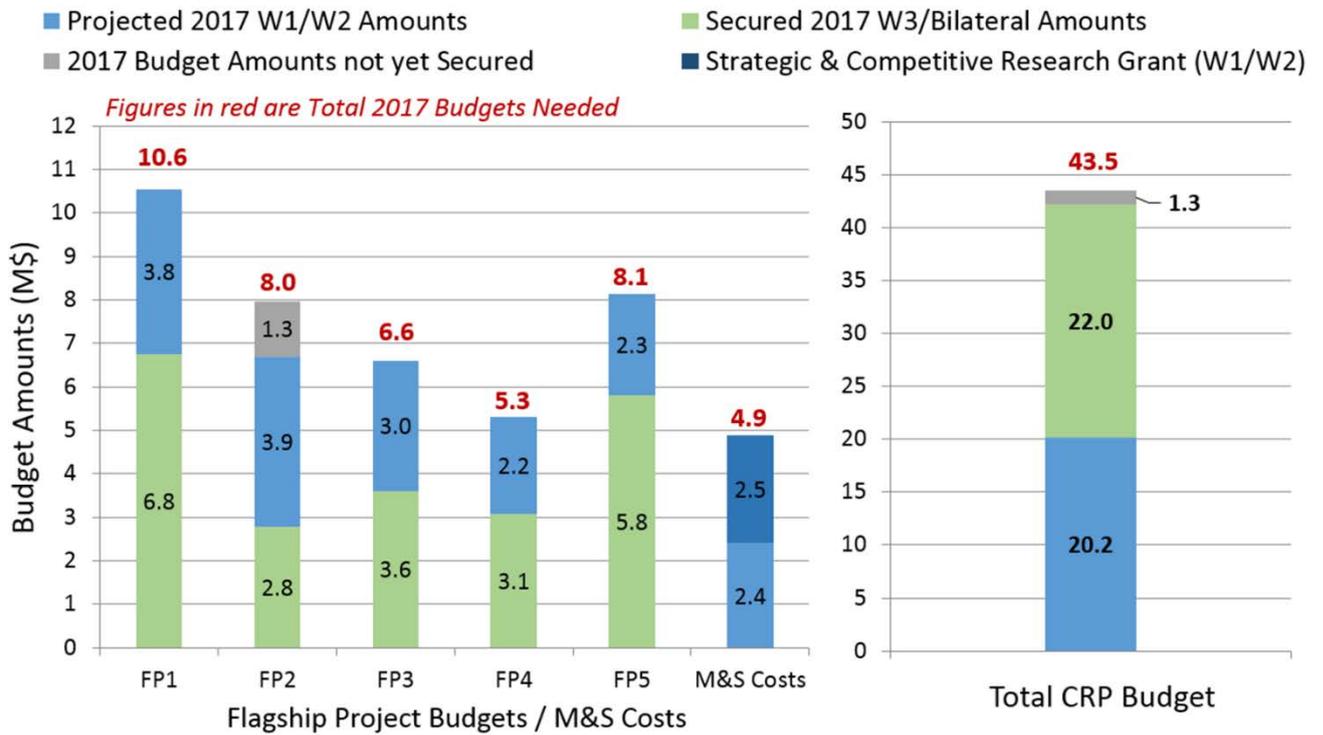
B+: Good – a sound research proposal but one which is largely framed by 'business as usual' and is deficient in some key aspects of a CRP that can contribute to System-wide SLOs.

B: Fair – Elements of a sound proposal but has one or more serious flaws rendering it uncompetitive; not recommended without significant change.

C: Unsatisfactory – Does not make an effective case for the significance or quality of the proposed research.

<sup>2</sup> The CRP targets have not been independently verified.

## LIVESTOCK 2017 FP and CRP Budgets: W1/W2 Amounts, W3/Bilateral Amounts & Shortfalls (US\$M)



Data Source: CGIAR System Management Office

## 2. Characterization of Flagships

FP	Main strengths	Weaknesses/Risks	Rating
<p><b>FP1: Livestock genetics</b> Aims to apply new genetics and genomics opportunities (in combination with management strategies) to increase livestock productivity.</p>	<ul style="list-style-type: none"> <li>• Potential strategic relevance as enhanced genetics can represent an important avenue to improving productivity of indigenous livestock.</li> <li>• High scientific quality as it intends to leverage advances in genomic, phenomic, and breeding research.</li> <li>• Comparative advantage through research partnerships.</li> </ul>	<ul style="list-style-type: none"> <li>• Weak justification that genetic potential of indigenous livestock species is a limiting factor for the focus systems; and, that demand will be met through existing indigenous stock.</li> <li>• The comparative advantage in livestock genetics for indigenous breeds is clear, but FP1 may lack a comparative advantage if systems shift towards imported genetics.</li> </ul>	Moderate
<p><b>FP2: Livestock health</b> Aims to improve animal health through herd health management, vaccines and diagnostics.</p>	<ul style="list-style-type: none"> <li>• Addresses a key problem area as high prevalence of livestock diseases cause significant loss to producers, and poses risks to human health from livestock diseases.</li> <li>• A holistic approach to health that feeds into an alternative model of animal disease management.</li> <li>• Appropriate strategic science partners with strong track records.</li> </ul>	<ul style="list-style-type: none"> <li>• Weak justification for selection of priority diseases.</li> <li>• Risks inherent in vaccine development and delivery that may impede the likelihood of impact.</li> <li>• Insufficient specification of timeline of impacts: the additionality is unclear since many outputs are based on current pipeline.</li> </ul>	Strong
<p><b>FP3: Livestock feeds and forages</b> Aims to increase livestock productivity and reduce environmental impacts by identifying, testing and delivering superior feed and forage strategies and options.</p>	<ul style="list-style-type: none"> <li>• Potentially high strategic relevance as animal nutrition is a constraint to productivity increases, especially within the targeted smallholder systems. Key sub-sector in livestock-related GHG emissions, potential for sequestration/mitigation outcomes.</li> <li>• Collaboration across the CGIAR on feeds and forages.</li> </ul>	<ul style="list-style-type: none"> <li>• Weak track record of delivery at scale.</li> <li>• Comparative advantage vis-à-vis other comparable research and the development of private sector feed industry is unclear.</li> <li>• Lack of detail on research priorities, science outputs and timelines.</li> </ul>	Weak

FP	Main strengths	Weaknesses/Risks	Rating
<p><b><i>FP4: Livestock and the environment</i></b>  Aims to enhance the efficiency of natural resource use, and reduce the negative impacts of livestock production on ecosystems while enhancing the positive ones and adapting livestock systems to future climate change.</p>	<ul style="list-style-type: none"> <li>• Strong strategic relevance to SLOs/SDGs: livestock sector is a major driver of climate change and potential for generating IPGs high.</li> <li>• Clear track record in some FP focus areas (e.g., emissions modelling, rangeland management).</li> <li>• Promising research collaborations with CCAFS and WLE on resource management and environment policy issues. Elaborated linkages with other FPs.</li> </ul>	<ul style="list-style-type: none"> <li>• Narrow approach to research prioritization with focus on climate change aspects of livestock and environment.</li> <li>• Little specificity on systems approach and analysis of trade-offs.</li> </ul>	Moderate
<p><b><i>FP5: Livestock livelihoods and agro-food systems</i></b>  Aims to maximize livestock based livelihoods and resilience to risk among women and men smallholder and pastoral producers and their communities.</p>	<ul style="list-style-type: none"> <li>• Potential strategic relevance is high with clear theory of change. Appropriately focused on value chains.</li> <li>• Indications of links with PIM and A4NH on foresight, policy, value chains, nutrition, and food safety.</li> </ul>	<ul style="list-style-type: none"> <li>• Unclear basis for prioritization of scientific research questions.</li> <li>• Generalizability of smallholder dairy success story is questionable.</li> <li>• Significant risk that research will deliver only localized outcomes and impacts.</li> </ul>	Weak

### 3. Assessment of CRP response to the ISPC major comments

Initial ISPC comment (16 June 2016)	CRP response/changes proposed (31 July)	ISPC assessment (14 September)
<p><b>1. For all Flagships, additional explanation on scientific opportunities identified through the priority setting process and their relevance to CRP and Flagship-level Theory of Change is needed. Such a narrative should include evidence on the most important constraints to achieving stated objectives (identified from past work), and how research can address these constraints and deliver outcomes/impacts.</b></p>	<p>Framework that drives CRP/FP prioritization: Functioning markets with vibrant, inclusive private sector, reliable supply of livestock commodities and enabling policy environment are prerequisites for adequate supply of animal source foods (ASFs) to rural and urban consumers while generating sufficient income (mostly smallholder producers) and securing the natural resource base. The specifics within Flagships takes into account the need to deliver some short term solutions (achieved in six years) while recognizing the need for investment in new technologies that will be critical to maintaining productivity over the next 10-20 years but will take much longer to deliver.</p> <p>Acknowledges that the three elements (markets, productivity, enabling environment) have been the subject of decades of research, but development impacts have been questioned, necessitating the need for re-evaluation and prioritization of ‘traditional’ areas. CRP’s review of evidence concluded that three elements are interdependent and must be addressed together to achieve impact. And, that the balance and prioritization of activities across three elements depends on context-specific constraints and is expected to change over time.</p> <p>Globally, work is being undertaken to develop and apply an appropriate framework to guide prioritization for livestock research in line with the conceptually powerful crop yield gap analysis approach.</p>	<p><b>Partially addressed.</b></p> <p>This response embraces the ambitious idea that an integrative approach is needed to address problems in production, supply and consumption of ASFs, and that transformational change will require attention to entry points that will most readily achieve net gains across each of the food system domains.</p> <p>There is a trifurcation in terms of research entry points: technologies, genetic gains, and policies. The CRP also differentiates between short term solutions that can be delivered within six years and longer term investments which may deliver in 10-20 years. That said, the underlying agenda still seems to be focused on ‘yield gap’ thinking, and a focus on smallholder systems.</p> <p>Overall, despite sound reasons for focussing on smallholder animal production systems, including the argument that scientific opportunities are intense for these systems and these are under-researched elsewhere in the world, it is important for the CRP to better articulate and defend the role of livestock in smallholder production systems in meeting the growing demand for ASFs.</p>

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<p>2. <b>Present further clarification on the scientific rationale underpinning the research focus on improved livestock breeds, vaccines, and improved feeds and forages; how the broader technical advances will lead to research success within six years; and, how risks will be mitigated or managed.</b></p>	<p>Detailed response to each of the sub-questions.</p> <p>A continued focus on yield gaps and genetics is justified by the assertion that smallholder productivity is the overall livestock research goal of the CRP, and it is argued that this cannot be improved without addressing genetic of indigenous stock. Hence, the portfolio includes a range of approaches (indigenous breed improvement, cross breeding, etc.) along with improved commodity traits and conserving genetic adaptation of indigenous livestock to environmental challenges. FPI also includes an important discovery component (indigenous livestock genome characterization). References to publications that document links between genetics/genomics approach and livestock trait performance (commercial breeds) included. In the short-term, research successes rely on delivery and implementation of established (demonstrated at smaller scale in Phase 1 CRP L&amp;F) technical solutions such as artificial insemination (dairy), mobile technologies for on-farm live recording of performance (chickens, dairy) etc.</p> <p>Vaccine research is acknowledged to be an enduring and long-term need, but the application of new science and lab techniques (systems approach with big data and multidisciplinary science) is proposed as the way to enhance the rate of vaccine development, cost-effectiveness and speed of delivery. Short-term deliverables will stem from improvements to existing vaccines (PPR, CCPP, ITM for ECF), enabling policy environment for livestock healthcare strategies etc.</p> <p>For improved forage work, the main innovations centre on cassava peels, brachiaria and multi-purpose cereals, each of which represents part of an existing</p>	<p><b>Partially addressed.</b></p> <p>Genetics and novel vaccines/herd health are certainly important goals offering much promise of impact, but there isn't enough evidence to strengthen the argument that established technical solutions can deliver targets within six years. This risk is higher for the feed and forage work where scaling up of existing solutions is critical for results at scale. This doesn't invalidate the proposal, but there are implicit assumptions about high returns and relatively low risks.</p>

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	<p>pipeline of research. The constraints to scale and lasting impact are described as lack of appropriate and responsive solutions, as well as delivery and business models. Having feeds work bundled with other technological solutions and developed in the context of wider LLAFS related ambitions (livelihoods, food security etc.) is proposed as one of the approaches to address this.</p> <p>The potential risks associated with each line of research are addressed separately in the Addendum. There are said to be few risks attached to the technology development stream, and risk to scaling up of forage work is said to be mitigated through FP5. For the vaccine and herd health work, inclusion of processes to ensure “stop-go” decisions so investment doesn’t continue without due cognizance of the likelihood of success (informed by technical progress and feasibility as well as the realities of disease prioritization in focus systems and value chains) forms the risk mitigation strategy.</p>	
<p><b>3. Provide additional information on the functional integration with other AFS CRPs to clarify how the LIVESTOCK CRP will influence trait discovery in crop breeding CRPs and assess potential trade-offs between the uses for crop and livestock production.</b></p>	<p>Work on full purpose crops was developed in close consultation with AFS crop commodity CRPs. This is viewed as a new paradigm in crop improvement, and draws on experiences from research on most key cereal and legumes in first Phase. Example of proof-of-concept studies influencing new variety release cultivar traits (for sorghum and pearl millet) are given.</p> <p>The idea of trade-offs in growing or purchasing fodder/food is made explicit, and is acknowledged as an important factor in determining adoption and scale-up of innovations. A systems lens is proposed to</p>	<p><b>Satisfactorily addressed.</b></p> <p>The response suggests that the CRP sees itself as providing information that other CRPs would need to incorporate into their genetic improvement and breeding activities in the long run. This logic is fine, with some embedded risks i.e., if the information provided is not in line with the demand or priorities of other CRPs. It will be important to identify how the agro-economic and economic trade-offs would be addressed through LIVESTOCK CRP in a way that facilitates upscaling of traits by other researchers and of adoption by farmers.</p>

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	enable partnerships with other CRPs, with recognition that not all trade-offs can be resolved.	
<p><b>4. Even though the targets are overly optimistic for many CRPs, LIVESTOCK is an outlier in that some of the targets proposed (number of people likely to be lifted out of poverty, rate of yield increase) do not appear credible. These targets should be revisited or additional justification, grounded in empirical evidence, provided for the numbers quoted.</b></p>	<p>Overly ambitious targets recognized and IDO targets revised, with the methodology on how numbers were derived described. Sub-IDO level targets remain unchanged. The number for yield changes is much higher than crop CRPs because of greater potential in synergistic approach (combining genetics, feed and health). Feed and forage breeding at early stage, and significant increases possible before diminishing returns sets in.</p>	<p><b>Partially addressed.</b> Additional explanations and calculations are welcome, but with implicit issues in assumptions on constraints to scaling for existing technical solutions (risk that the critical constraints are elsewhere or may not be addressed through research), and insufficient attention to rates of change in poverty (the expected decline in poverty over the six years has to be accounted for).</p>
<p><b>5. Include additional detail on the CRP's relationship with the private sector, and how this contributes to maximizing LIVESTOCK's comparative advantage.</b></p>	<p>A two-fold response: recognition that private sector is key to promoting business-based development models, and that engagement with the private sector will be framed by clear principles.</p>	<p><b>Satisfactorily addressed.</b> Recognition that the private sector is a critical part of the livestock/ASF value chain is welcome. How such an engagement maximises CRP comparative advantage is worthy of monitoring over time.</p>