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**Current status and options for livestock biotechnologies in
developing countries**

**A. TRAORE, CNRA, MALI
(Discussant)**

A comprehensive and well synthesized document

❖ Key elements on the use of livestock biotechnologies in developing countries:

- ✓ Extent of their current use;
- ✓ Reasons for their success or failure in the past;
- ✓ Emerging challenges;
- ✓ Future options (dev. countries/int. community)

❖ Three main domains of Application :

- ✓ Animal breeding and reproduction;
- ✓ Animal health;
- ✓ Animal nutrition ;

What have we learned from the Past?

❖ **Artificial insemination (AI)** the most widely applied animal biotechnology, but still faced in many developing countries:

- ✓ Technical constraints (Heat detection!);
- ✓ Organizational and operational constraints (not embedded in a comprehensive livestock breeding policy!);
- ✓ Cost efficiency aspects (High liquid Nitrogen cost, High service cost).

❖ **Embryo transfer (ET)** far less used and at a much greater price!

❖ **Marker-assisted selection** not so used as in crop improvement! It is going to play a more important role in relation with the need to characterize and conserve animal genetic resources.

What have we learned from the Past?

- ❖ **Biotechnologies in animal health, an emerging field for the future!** It may even surpass the biotechnology application on animal production (precision disease diagnostic, thermo stable and multi component vaccine)
- ❖ **On the statistic:** reliable quantitative information on the use of livestock biotechnologies in developing countries is generally lacking! It needs to be addressed.
- ❖ **Causes for success or failure:** under others raisons, biotechnology is often not integrated with others livestock improvement strategies; we should seek for more complementarities: services, organized markets, infrastructure development, improvements in animal nutrition and health!

Looking Forward - Preparing for the Future

❖ Trends

- ✓ Molecular biotechnologies will play **an even-greater role in diagnostics, epidemiology, and vaccine development.**
- ✓ Climate change and environmental degradation are currently issues of critical importance and livestock production has been implicated as a substantial contributor! Biotechnologies can play a role in alleviating the environmental impact of livestock. The extensive pastoral system in Africa is far less concerned with such criticism! We should also consider the **positive role of livestock through manure in the nutrient recycling.** Mostly those criticism concern the intensive beef and pig production in the Nord!
- ✓ The genetic diversity of livestock is in a state of decline globally! Demand for increased production has led many countries to import germplasm, endangering their local genetic resources. **The Interlaken initiative should be stressed** in this international year of Biodiversity! It is of interest to develop a kind treaty as the PGR-treaty.
- ✓ **Molecular genetics, in concert with conventional breeding approaches,** can be used in genetic improvement programmes for indigenous breeds, making them more competitive and helping to ensure their *in situ* conservation

Looking Forward - Preparing for the Future

❖ **Specific options** can be identified for developing countries to help them make informed decisions regarding adoption of biotechnologies:

✓ First, if biotechnologies are to be adopted they should build **upon existing conventional technologies**.

✓ Second, biotechnologies should be **integrated with other relevant components** of livestock production.

✓ Third, the application of biotechnologies should be **supported within the framework of a national livestock development programme**.

✓ Fourth, it should be borne in mind that the target **end users of these biotechnologies are normally resource-poor farmers with limited purchasing power!**

Others recommendations for the Future

- ✓ **The international community can play a key role in supporting developing countries** by providing a framework for international cooperation and funding support for the generation, adaptation and adoption of appropriate biotechnologies.
- ✓ **North-South and South-South collaborative programmes and partnerships should be developed** and fostered through the consistent and long-term provision of sufficient funds.
- ✓ International funding agencies should allocate **increased funding to R&D in animal science in developing countries and support the training of personnel** in quality research, because research competence is a prerequisite for harnessing the benefits of animal biotechnologies.
- ✓ Public awareness of advanced animal biotechnologies should be encouraged and enhanced by international organizations **providing science-based information** regarding their efficacy, safety, costs and benefits in the development context.

Thank you