

## Workshop summary

Eric Hallerman

This workshop has left me with several deep impressions.

The first was the steady advance of gene technology, especially gene editing. There has been increasing integration of gene technology into classical animal breeding; application of gene technology into non-agricultural species, especially insects; exploration of the utility and risks of gene drives, especially to control insect pests; and integration of gene technology into both crops and insect pests for an integrated systems approach. I find this all quite exciting in terms of what it poses for animal production and pest control, and for promoting the sustainability and resiliency of animal production systems in West Africa.

My second impression is that novel applications in animal biotechnology are on the verge of being integrated into agriculture and pest control.

The real contribution of biotechnology to agriculture and human well-being will be in developing countries, but four broad issues will have to be resolved:

- There are the technical issues of development of the GE lines. Work on that is ongoing.
- Then there is the development of effective regulatory systems. This will include development of the capacity to evaluate GE lines for prospective use on a host country, using the tools of problem formulation, risk assessment, and risk management that we spoke about in this workshop. Those in this workshop will need to make judicious regulatory decisions, and to communicate them effectively to a full range of publics.
- Full realization of the benefits of gene technology, or for that matter, selectively bred lines, will depend upon development of an infrastructure to distribute improved genetic lines. That will involve public-private partnerships. I believe those wheels are starting to turn.
- To be proactive and effective, regulators will need to monitor the outcomes of animal biotechnology in terms of improved productivity, agricultural sustainability, and socioeconomic outcomes.

Participants in this workshop are the regional leaders in addressing these issues. I trust that this workshop helped you develop your knowledge and capacity for regulatory oversight. None of us has the knowledge, wisdom, and capacity to do this alone, so a key outcome of this workshop is the network of regulatory professionals. So, go out and execute your mandate. The organizers and I wish you every success.