

IDRC's Work on Vaccines and Alternatives to Antimicrobials & partnership with WOA: InnoVet-AMR 2.0 initiative

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A more **sustainable** and **inclusive** world

As part of Canada's foreign affairs and international development efforts, and with five regional offices and a global network of partners and researchers, we have the breadth and experience to respond to global challenges.



IDRC Core Objectives

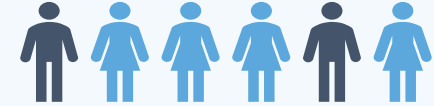
- ✓ Invest in high-quality research and innovation in developing countries
- ✓ Mobilize alliances for impact: deepen and expand our collaboration and pursue new partnerships to grow the available resources for research.
- ✓ Move solutions forward thanks to alliance with the public, private, and other actors.
- ✓ Research that considers gender with other forms of inequality. This research ensures women, girls, and other marginalized groups are not left behind.
- ✓ IDRC helps build strong scientific institutions and systems to enable an environment that encourages high-quality research and innovation.

Animal Health: The Challenge



> 1 billion farmers

in central and south America/Caribbean, sub-Saharan Africa, and south & southeast Asia rely on livestock for their livelihoods. The majority are women.



Limited innovations

for animal diseases in LMIC's

Limited interest

from Big Pharma –
unsustainable profits



1 in 4

animals are
lost to infectious
diseases



AMR

evolving threat
of antimicrobial
resistance



Climate change

unpredictable effect on disease

LVIF

Livestock Vaccine
Innovation Fund
2015-2024



CAD 57 million



Neglected diseases

InnoVet-AMR

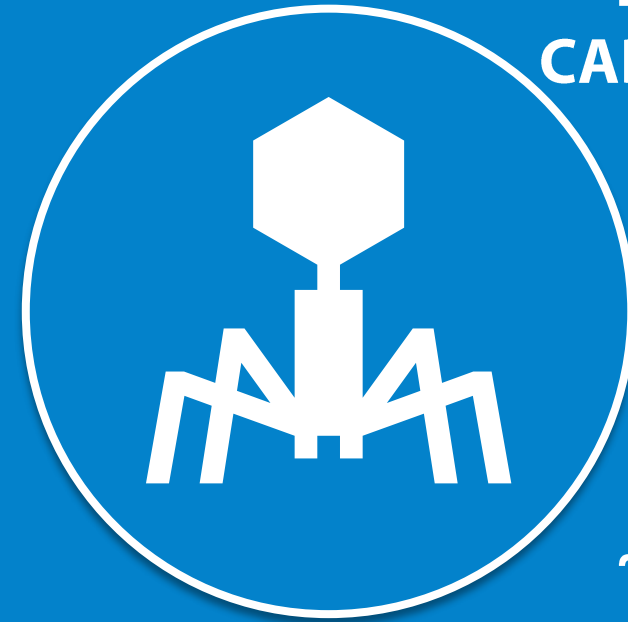
Innovative Veterinary Solutions
for Antimicrobial Resistance

Phase 1.0 2018-2023

Phase 2.0 2023-2027



**Phase 1.0
CAD 30 million**



**Phase 2.0
~ CAD 28.6
million**

Reduce AMR

Innovative Veterinary Solutions for Antimicrobial Resistance (InnoVet-AMR)

- **Support research that will identify innovative veterinary solutions**, including vaccines and alternative solutions, **to reduce the use of antimicrobials in livestock and aquaculture operations** in low and middle-income countries (LMICs)
- **Build effective partnerships** to better coordinate the discovery, development, and sustainable delivery of innovative veterinary solutions to reduce the use of antimicrobials in livestock and aquaculture operations in LMICs

Partners



CA \$

~56.8 million



InnoVet-AMR 2.0

List of Research Partners

Cuba

- The University of Waterloo (subgrantee: Centro de Ingeniería Genética y Biotecnología) (Canada (Cuba))
- University of Alberta (Canada)
- University of Prince Edward Island (Canada)

Technology

Thermoregulation / antimicrobial peptides



Brazil

- Vaxinano (France)
- Embrapa (Brazil)

Technology

Vaccine



Tunisia

- Muséum national d'Histoire naturelle (France)
- University of Laval (Canada)
- Institut Supérieur des Sciences Biologiques Appliquées de Tunis (Tunisia)

Technology

Bacteriocins



Ethiopia

- The Illinois University (USA)
- National Veterinary Institute (Ethiopia)

Technology

Antimicrobial peptides



Pakistan

- University of Purdue (USA)
- University of the Punjab (Pakistan)
- University of Sargodha (Pakistan)

Technology

Bacteriophages/ nutraceuticals



Thailand

- University of Montreal (Canada)
- University of Alberta (Canada)
- Thammasat University (Thailand)

Technology

Vaccine



- Asian Institute of Technology (Thailand)

Technology

Nanobubbles, Vaccine



- National Science and Technology Development Agency (NSTDA) (Thailand)
- Faculty of Agro-Industry, Kasetsart University (Thailand)

Technology

Bacteriophages



Vietnam

- University of Sterling (UK)
- Southern Monitoring Centre (Vietnam)

Technology

Vaccine



- Institute of Microbiology and Biotechnology (Vietnam)
- Vietnam National University (Vietnam)

Nigeria

- Institute of Agrifood Research and Technology (IRTA) (Spain)
- University of Ilorin (Nigeria)
- Royal Holloway University of London (RHUL) (UK)

Tanzania, D.R. Congo

- Sokoine University of Agriculture (Tanzania)
- University of Kinshasa (D. R. Congo)
- McGill University (Canada)

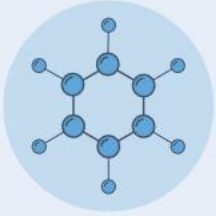
Kenya

- Université Laval (Canada)
- International Livestock Research Institute (Jomo Kenyatta) (Kenya)

Malaysia

- Universiti Putra Malaysia (Malaysia)

Technologies



Antimicrobial peptides

- Novel Therapeutics Leads as alternatives to antibiotics to control bacterial infection in ruminants
- Dynamic thermoregulation as an alternative to antibiotics



Probiotics

- Phase II Innovative QSI Algae-Biofloc System for Sustainable Shrimp Aquaculture
- Advanced approach toward a highly efficient indigenous probiotics an alternative strategy to reduce antibiotic usage for development of a sustainable shrimp aquaculture in Vietnam



Phytochemicals

- Development of COMMI nano formulation from Commiphora plants resins for innovative treatment of mastitis in dairy animals
- Phase II Reducing antibiotic resistance through the commercialization and adoption of non-antibiotic methods to control bacterial infections in Pakistani poultry production



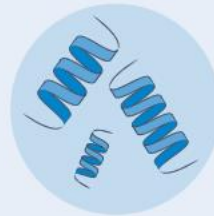
Biosecurity / Husbandry

- Phase II Applications of nanobubbles to reduce antibiotic use in aquaculture
- Dynamic thermoregulation as an alternative to antibiotics



Vaccine

- Phase II Novel vaccine design as an alternative to antimicrobial use for preventing and controlling the swine and zoonotic agent Streptococcus suis
- Phase II Polyvalent vaccine for freshwater catfish (Pangasius)



Bacteriocins

- Phase II Les bactériocines - une alternative naturelle fort prometteuse pour le remplacement des antibiotiques en production avicole en Tunisie



Bacteriophages

- Phase II Reducing antibiotic resistance through the commercialization and adoption of non-antibiotic methods to control bacterial infections in Pakistani poultry production
- Harnessing bacteriophages for mastitis prevention in Kenya in goats

InnoVet-AMR product pipeline



Stages of research and development of a product in the pharmaceutical industry



InnoVet-AMR 2.0 Portfolio



Exploratory



Phase II Novel vaccine design as an alternative to antimicrobial use for preventing and controlling the swine and zoonotic agent *Streptococcus suis*

Phase II Les bactériocines - une alternative naturelle fort prometteuse pour le remplacement des antibiotiques en production avicole en Tunisie



Phase II Scale-up of the bioproduction process of an ovo nanovaccine to protect broilers against avian colibacillosis in poultry farms in low and middle-income countries

Phase II Reducing antibiotic resistance through the commercialization and adoption of non-antibiotic methods to control bacterial infections in Pakistani poultry production



Phase II Polyvalent vaccine for freshwater catfish (*Pangasius*)

Phase II Applications of nanobubbles to reduce antibiotic use in aquaculture



Phase II Innovative QSI Algae-Biofloc System for Sustainable Shrimp Aquaculture



Discovery



Harnessing bacteriophages for mastitis prevention in Kenya in goats



Novel Therapeutics Leads as alternatives to antibiotics to control bacterial infection in ruminants



Development of COMMI nano formulation from Commiphora plants resins for innovative treatment of mastitis in dairy animals



Developing bacteriocin-rich extract from engineered lactic acid bacteria as an antibiotic alternative in ruminants and aquaculture



ShrimpGuard Development of phage associated formulation to combat antimicrobial resistant *Vibrio* spp in cultured shrimp

Advanced approach toward a highly efficient indigenous probiotics an alternative strategy to reduce antibiotic usage for development of a sustainable shrimp aquaculture in Vietnam



Dynamic thermoregulation as an alternative to antibiotics

Attrition rate in the animal health pharmaceutical industry

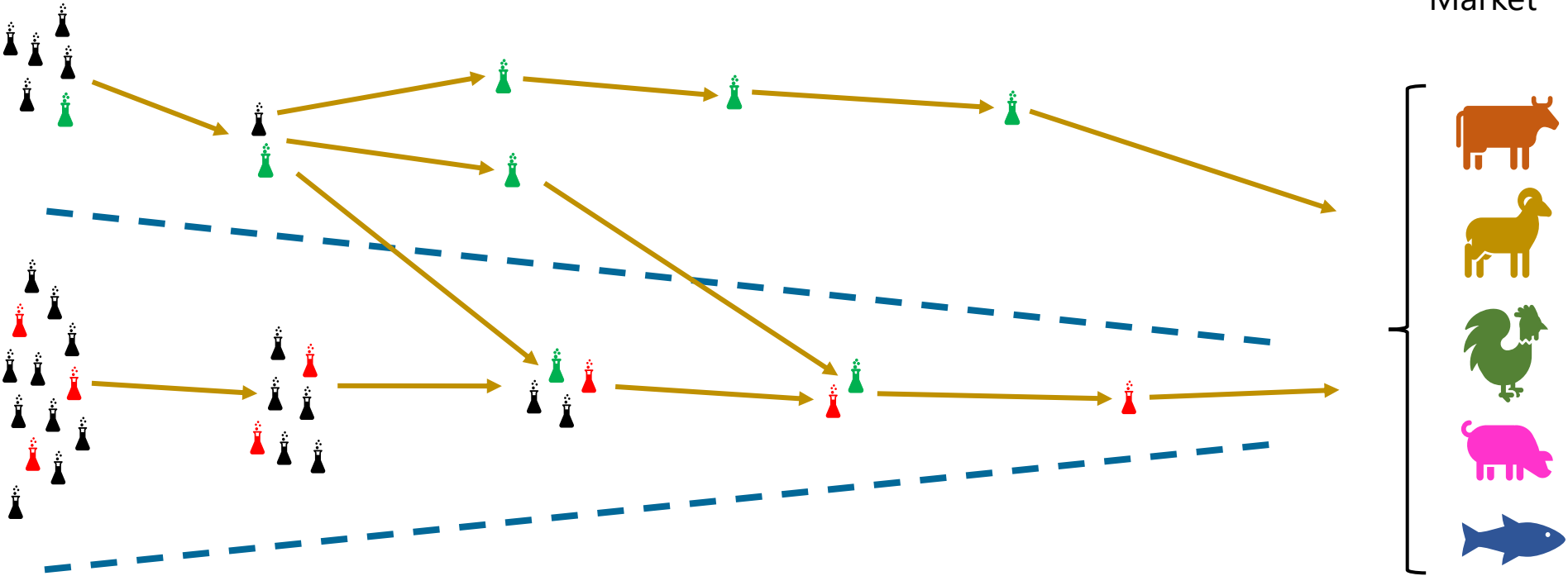
Academic Institutions & Biotech Companies

External knowledge base

Industry

Internal knowledge base

Current or New Market



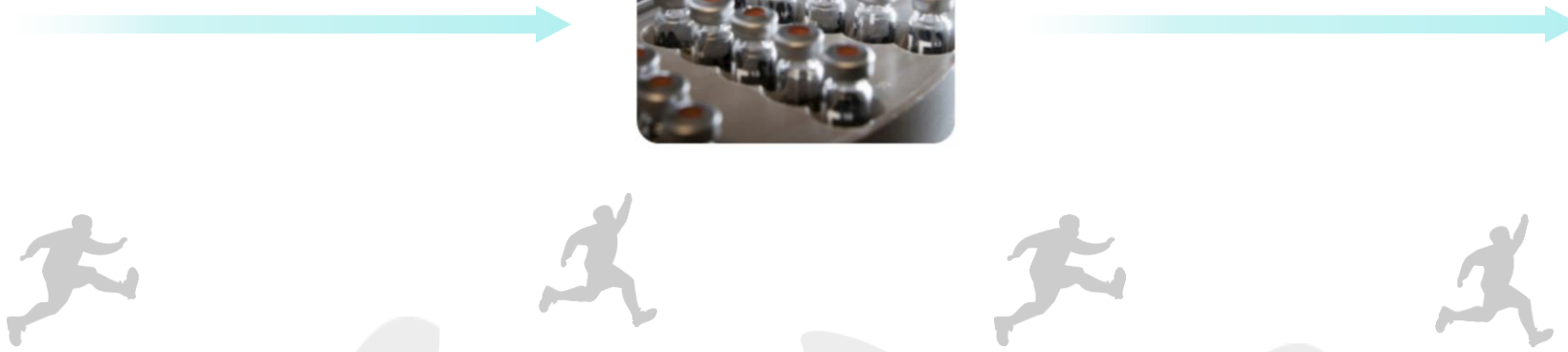
Product Development Pipeline



Maximum 10% of products reach market (7 – 12 years)



Research support to mitigate attrition rate of product development: Wrap-round support project



Discovery

Proof of
Concept

Exploratory
Development

Full
Development

Regulatory
Commercialization

- Quality systems (QA & QC) and Regulatory requirements
- Intellectual Property / Nagoya Protocol introduction
- Commercialization and Agribusiness introduction

- Gender and Social Inclusion Support
- Road to Market project (R2M)
- Policies

Knowledge Translation (KT)

Long term sustainability of our innovations

Relevance and alignment of knowledge and the knowledge users' needs, priorities, and mandates

Actionability of the knowledge being produced.

Accessibility of the knowledge being produced, in relation to language, technicality and access.

Visibility and awareness of the knowledge being produced among knowledge users.

Timing of dissemination being aligned with knowledge users needs and institutional cycles.



InnoVet AMR 2.0 - KT Approach

Long term sustainability of innovations on the ground



Private Sector

Commercialization
Intellectual property



Public Sector

Regulations
Nagoya Protocol



End user engagement

Farmers (Men and
Women)
Veterinarians



Work with WOA: Bridging Innovations with Global Policy

Improving access And legislation to veterinary products for the Americas (REASONS for Americas)

InnoVet-AMR is working together with WOA to address policy gaps in offering alternatives to antimicrobials in aquaculture in Central and Latin America with three work packages.

Funds: CAD 520,000

1. Scoping study - Cross-Sectoral Alliance Workshops in 4 LA countries
2. Testing of the Quadripartite One Health Legal Assessment Tool (OHLAT) in 2 LA countries
3. Case studies of best practices in using Alternatives

Foresight AMR & Climate Change.... Ongoing work

Future relationship of Climate Change, AMR & One Health

- Understand the effects of climate change on AMR in animal health and its cascading consequences. Being mindful of the following context:
 - Social Trends
 - Overuse and misuse of antibiotics
 - Inequitable access to antibiotics and healthcare
 - Environmental Trends
 - Spread of resistant pathogens across borders
 - Climate change amplifying AMR
 - Ecological Trends:
 - AMR in the Food Supply Chain
 - Technological trends:
 - Limiting new Antibiotic development



Conclusion...

- **InnoVet-AMR 2.0 is building on a strong foundation** laid by Phase 1.0, expanding its scope to include ruminants in Africa.
- **Innovative veterinary solutions are essential** to reduce antimicrobial use and combat AMR in LMICs, contributing to global health and food security.
- **Gender integration and knowledge translation** are central to ensure that innovations are inclusive, actionable, and sustainable.
- **Partnerships across public, private, and end-user sectors** are key to bridging the “valleys of death” in vaccine and product development and ensuring uptake.
- **Long-term sustainability** requires aligning innovations with regulatory frameworks, commercialization pathways, and community needs.
- **Enhance knowledge translation and stakeholder engagement** to improve adoption and policy alignment.





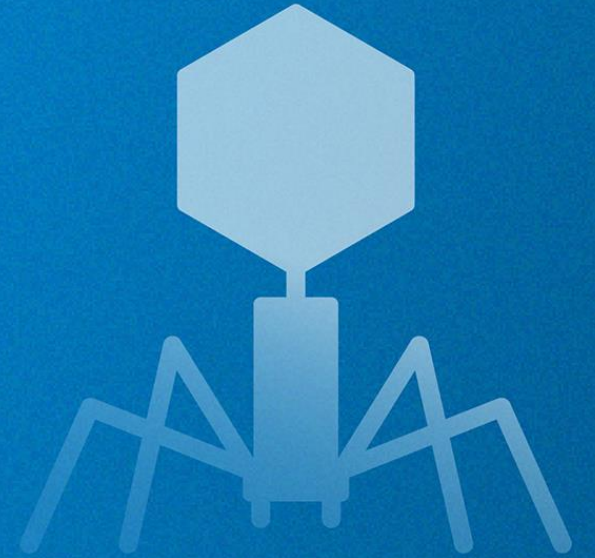
IDRC • CRDI

International Development Research Centre
Centre de recherches pour le développement international

Canada 

Thank you!

Promising Research on non-vaccine alternatives to antimicrobials in Africa Session: **InnoVet-AMR 2.0** research projects showcase



Kenya- Harnessing bacteriophages for mastitis prevention in goats.

Ethiopia- Antimicrobial peptides as alternatives to antibiotics to control bacterial infection in ruminants

Nigeria - developing bacteriocin-rich extract from engineered lactic acid bacteria as an antibiotic alternative in ruminants and aquaculture

Tanzania - development of COMMI nano formulation from Commiphora plants resins for innovative treatment of mastitis in dairy animals