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PROJECT ACT RX



**Veterinary & Mariculture -
Antiviral Development Program**



**EGG
PHARMA**



AGRICULTURAL CRISIS - THE HIDDEN PANDEMIC

Current Philippine Agricultural Losses:

Avian Influenza (H5N1): Active in 99 municipalities, ₱8.2 billion in poultry losses (2025)

African Swine Fever: 150,000 pigs culled, ₱2.3 billion economic impact

Nervous Necrosis Virus: 40% of bangus/tilapia hatcheries affected, ₱1.8 billion losses

Total Agricultural Viral Impact: ₱15.2 billion annually (DA-BFAR data)

Food Security Threat:

70% of Filipino protein comes from poultry, fish, and livestock

Viral outbreaks force mass culling, creating protein shortages

Small farmers lose entire livelihoods overnight

Import dependency increases when domestic production fails

The Regulatory Opportunity: Veterinary drug approval pathways are faster and less complex than human pharmaceuticals, offering a strategic entry point for broad-spectrum antiviral technology.

Strategic Vision: Use veterinary success to build platform for human applications.



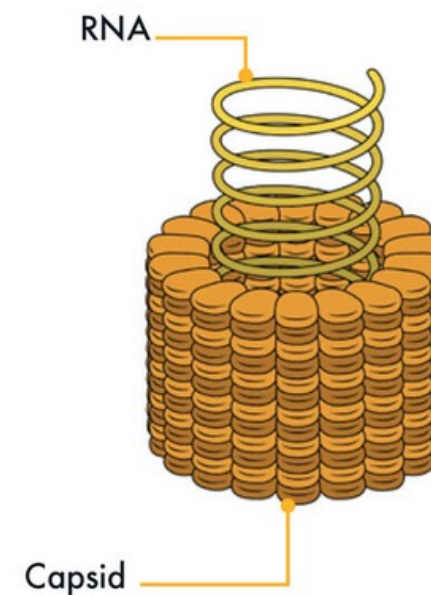


THE INVISIBLE INVADERS

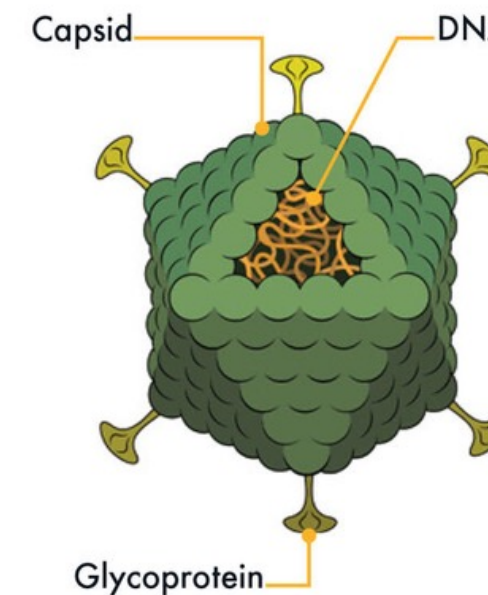
- Viruses are the smallest microbes, hijacking living cells to reproduce.
- Scientists debate if they're even "alive," yet they are ancient and everywhere — from the ocean depths to the air we breathe.
- They infect humans, animals, and plants — even the bees that pollinate our crops.

Takeaway: Viruses are the ghostwriters of extinction — unseen, but rewriting life's story.

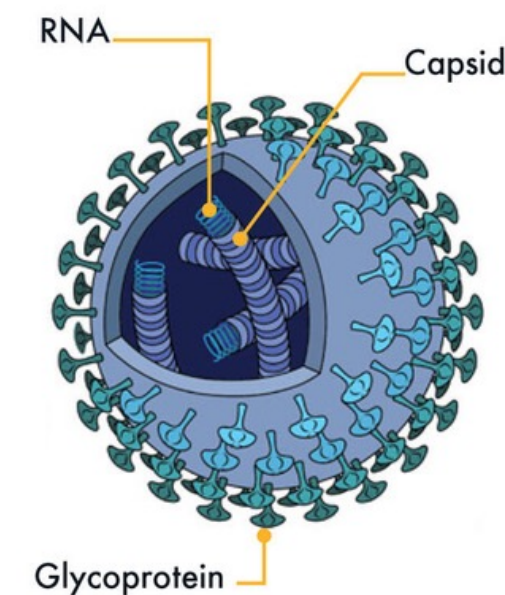
Types of Viruses



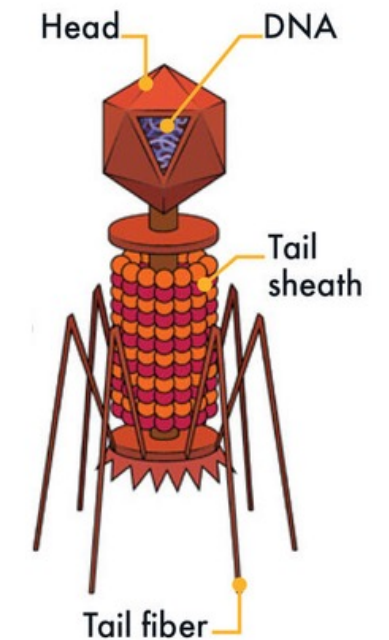
Helical viruses, like the Tobacco Mosaic Virus, which infects a number of different types of plants, have a slinky-shaped capsid that twists around and encloses its genetic material.



Polyhedral viruses, like adenoviruses, which are known to cause a range of illnesses from pink eye to pneumonia, are composed of genetic material surrounded by a many-sided capsid, usually with 20 triangular faces.



Spherical viruses, like the infamous Coronavirus, are essentially helical viruses enclosed in a membrane known as an envelope, which is spiked with sugary proteins that assist in sticking to and entering host cells.



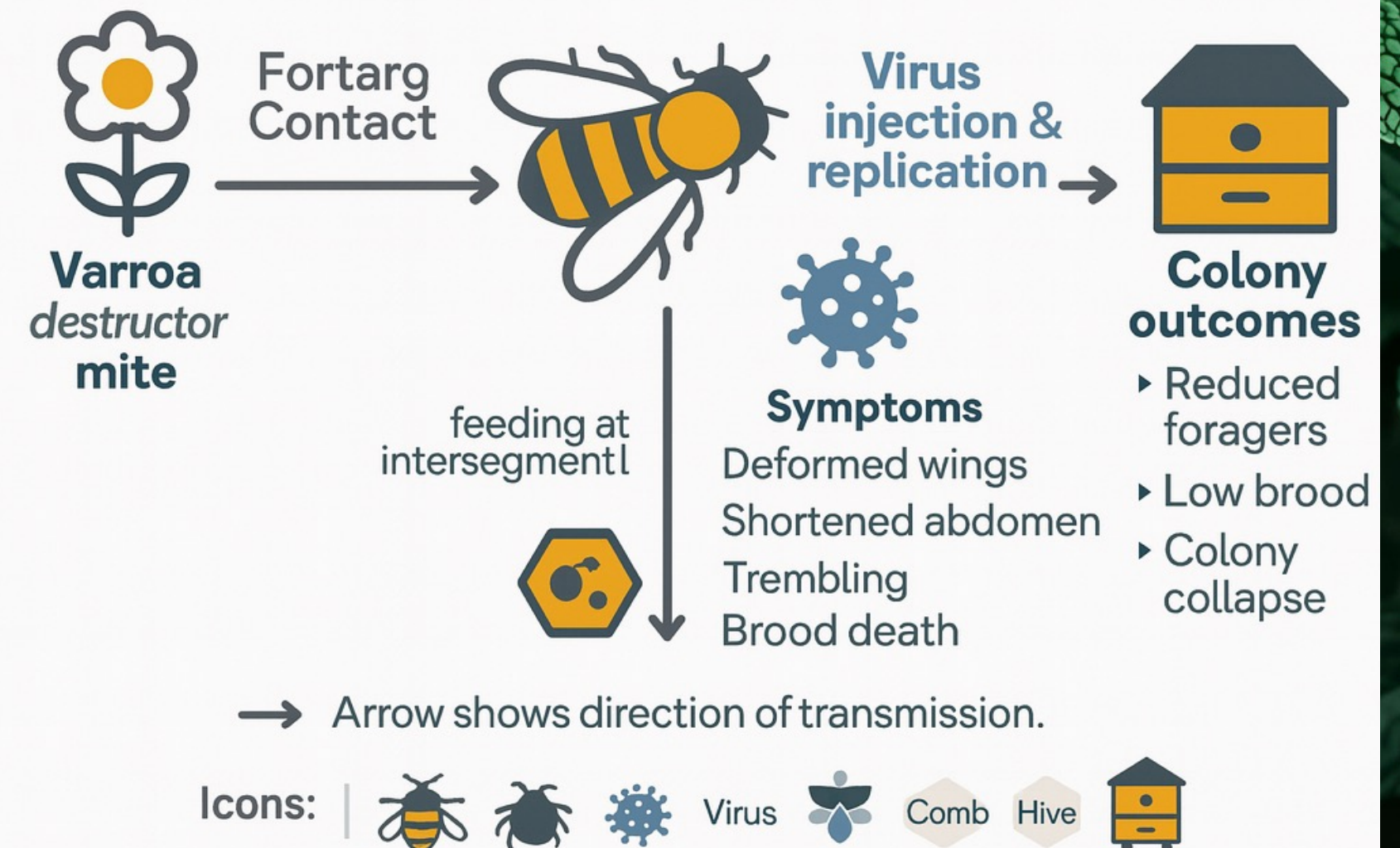
Complex viruses, like bacteriophages, which infect and kill bacteria, resemble a lunar lander, and are composed of a polyhedral "head" and a helical body (or "tail sheath"), and legs (or "tail fibers") that attach to a cell membrane so that it can transfer its genetic material.





HUMAN ORIGINS, ANIMAL THREATS

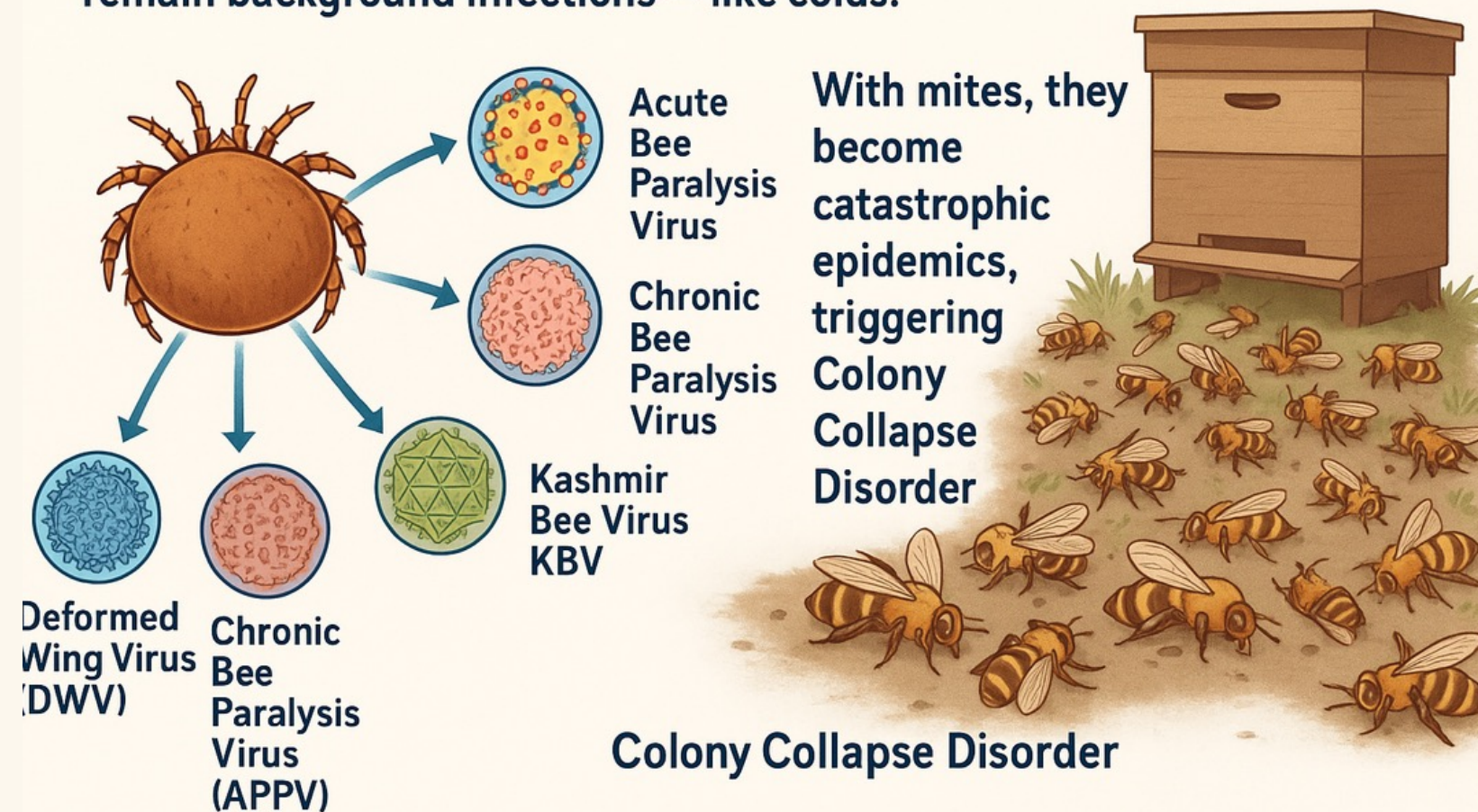
- Many of today's deadliest animal viruses actually originated in humans and spilled into farm animals.
- Once established, they evolved and came back as threats to food security.
- Examples: Measles → Rinderpest → Goat Plague; Human hepatitis-like viruses → Rabbit Hemorrhagic Disease; Human enteroviruses → Foot-and-Mouth Disease.



BEEES: POLLINATORS AT RISK

- 70% of crops depend on bees. Without them, diets shrink to staple grains.
- FAO warning: Pollinator decline endangers \$577B in global crops; viruses accelerate colony collapse.
- 62% average colony loss over winter — the worst in U.S. history.
- 1.6M colonies gone, costing \$600M in honey, pollination, and replacements.
- Without mites, bee viruses would remain mild. With Varroa mites, they explode into Colony Collapse Disorder

Big Picture: Without Varroa mites, most of these viruses would remain background infections — like colds.





CHICKENS: AVIAN FLU ON THE FRONTLINES

- Avian influenza (H5N1) spilled from humans to poultry; now active in 99 Philippine municipalities.
- WHO warning: Mutations could create a pandemic risk.
- Scary Stats: ₱68.76B poultry industry at risk; one outbreak erases hundreds of thousands of meals daily. Globally, H5N1 killed 462+ people since 2003.
- Warning: For Filipino families, chicken is the most reliable protein. Losing it means empty plates in every household.

“Every chicken culled for flu is a family’s dinner lost to an invisible enemy.”





RABBITS HEMORRHAGIC DISEASE:

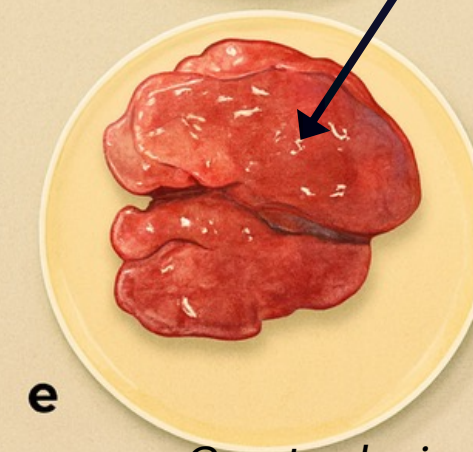
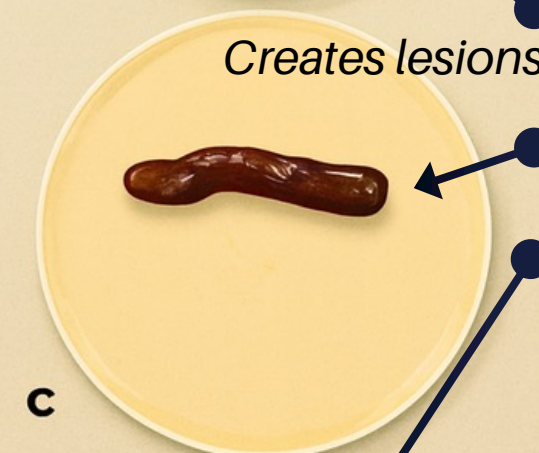
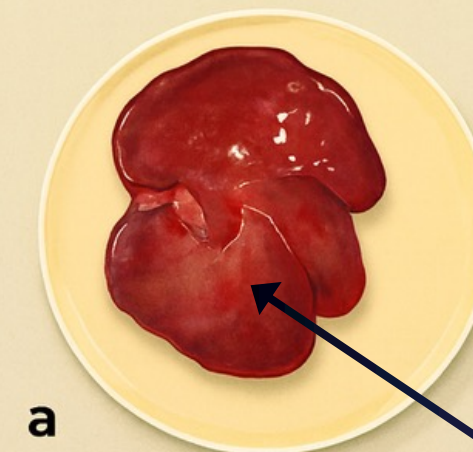
- RHD kills 70–100% of rabbits. Spreads via contact, insects, feed, even the air.
- Category A infectious disease; mass culling seen in China, Spain, and Australia.
- Scary Stats: In Spain, 90% of wild rabbits wiped out. Locally, threatens backyard farmers relying on rabbits for affordable protein.
- Warning: For families without poultry or cattle, rabbits are survival livestock. When RHD hits, food and income vanish overnight.

*“When the rabbits die,
the poorest families starve
first.”*

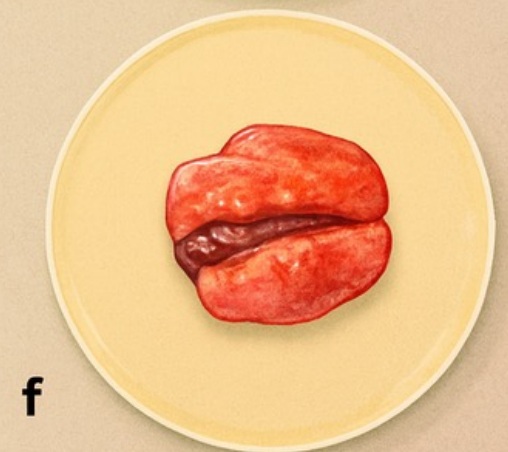
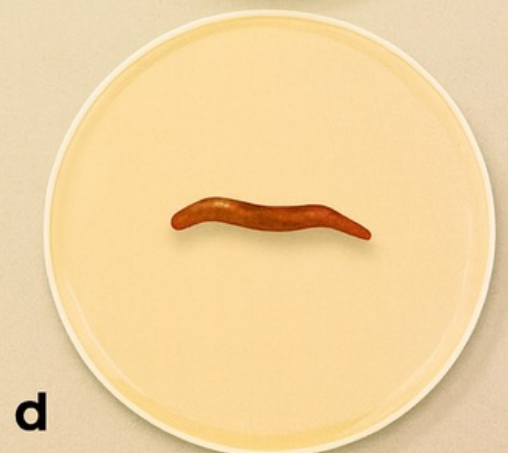
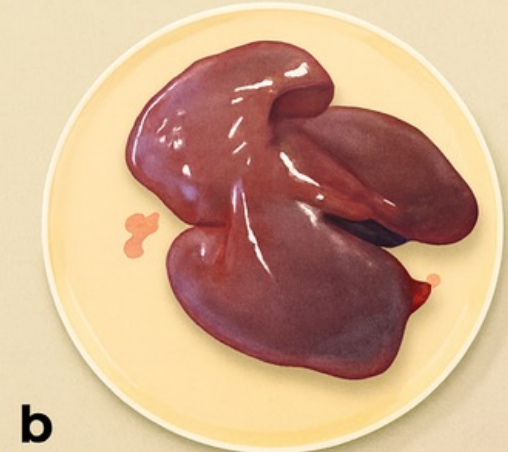


RABBIT HEMORRHAGIC DISEASE

RHD-suspected rabbit



Control rabbit



Creates lesions

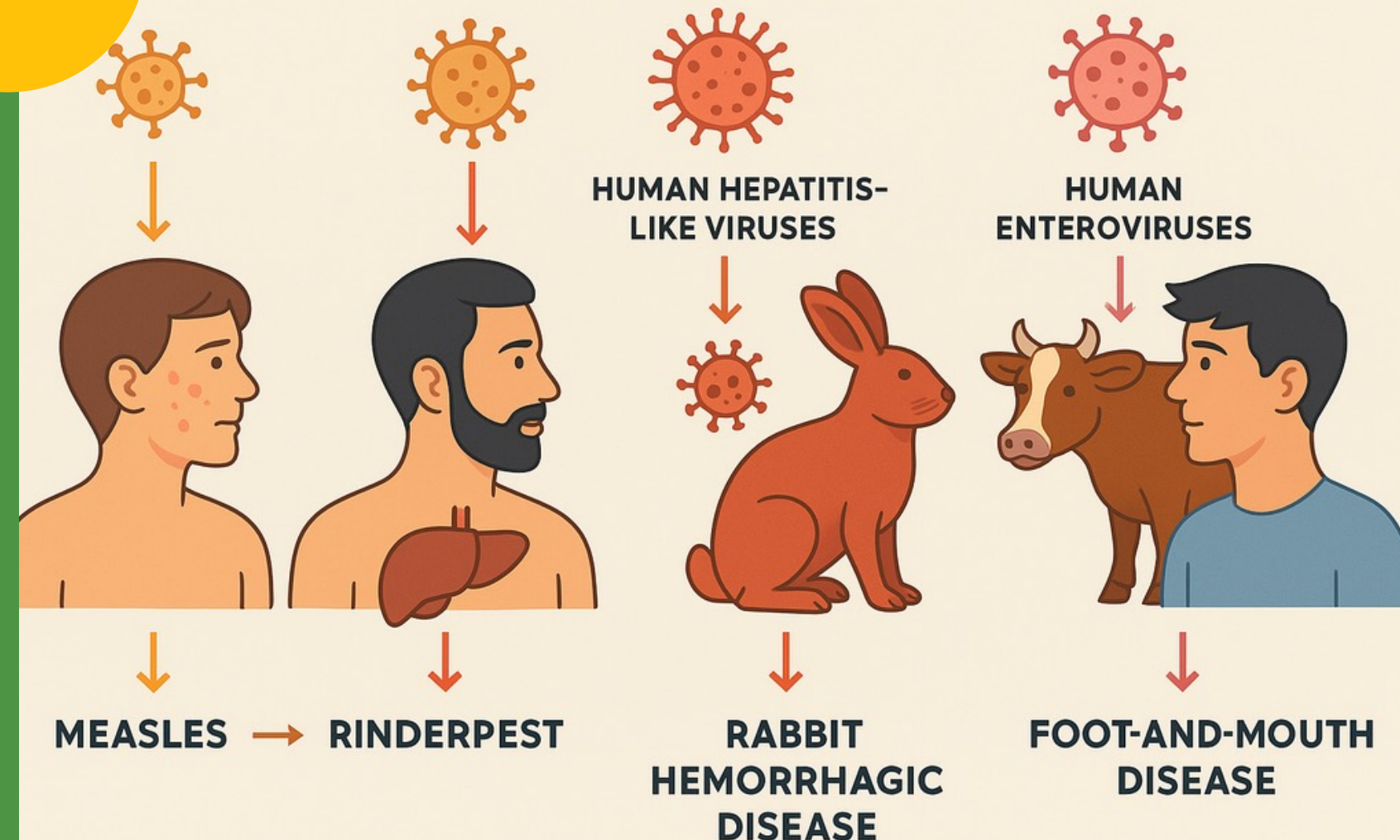
Creates lesions



COWS & GEESE: VIRUSES IN THE BARNYARD

- Cows: Bovine Viral Diarrhea Virus (BVDV) costs the U.S. \$2B annually. Human measles → Rinderpest → cattle plagues. Human retroviruses → Bovine Leukemia Virus. Human enteroviruses → Foot-and-Mouth Disease.
- Geese: Silent carriers of herpes-like viruses; outbreaks kill goslings, contaminate wetlands.
- Scary Stats: Rinderpest eradicated only in 2011 after killing millions. FMD outbreaks force mass culling, costing billions in lost exports.
- Warning: One sick cow = no milk for a family. One goose = silent infection spreading across flocks.

*The viruses we gave our animals now circle back,
eroding the very food we depend on*





FISH: NERVOUS NECROSIS VIRUS (NNV)

- Attacks nervous system of bangus and tilapia → blindness, erratic swimming, mass die-offs.
- FAO/NIH: NNV is a global aquaculture threat.
- Scary Stats: Hatcheries can lose 100% of fry in days. Aquaculture = 50% of Philippine protein; losses can hit millions of pesos.
- Man-to-Animal Transfer: NNV evolved from insect viruses; human farming practices amplified spread in fish hatcheries.
- Warning: For coastal families, ponds = protein + income + security. When ponds die, children go hungry.

*"Every dead fish in the pond
is an empty bowl on the table."*





GOATS: GOAT PLAGUE (PPR)

- Up to 90% mortality. Causes fever, diarrhea, pneumonia, rapid death.
- FAO/WOAH: Among the world's most dangerous livestock diseases. Annual losses = \$2B+.
- Man-to-Animal Transfer: Measles (humans) → Rinderpest (cattle) → PPR (goats). Proof that human viruses seeded livestock plagues.
- Warning: In rural communities, goats = "poor man's cow." If PPR enters the Philippines, millions of smallholder farmers lose everything.

*"Goat plague is just one border away
— and when it arrives, it burns like wildfire."*





SWINE FLU: THE VIRAL MIXING POT

- Swine influenza (H1N1 and related strains) arises when human, avian, and swine influenza viruses recombine inside pigs. This genetic mixing creates new flu variants capable of infecting humans.
- The 2009 H1N1 pandemic started in pigs, spread to humans, and infected over 1.4 billion people worldwide, causing an estimated 284,000 deaths. The World Health Organization warns swine remain a high-risk viral reservoir.
- Scary Stats: In the Philippines, pork is the most consumed meat (over 55% of national meat intake). A severe swine flu outbreak could devastate both farm incomes and public health, collapsing supply chains.
- Warning: Every pig farm is a potential viral factory. Without strong biosecurity, the next pandemic could emerge from a backyard pen.

*“Goat plague is just one border away
— and when it arrives, it burns like wildfire.”*





THE VIRAL WEB - HOW ANIMAL DISEASES THREATEN HUMAN HEALTH



75% of Emerging Human Diseases Start in Animals Cross-Species Viral Threats Currently in Philippines:

Poultry Sector:

- Avian Influenza H5N1: 462 human deaths globally, now endemic in Philippine poultry
- Newcastle Disease: Respiratory virus jumping to human farm workers
- Infectious Bursal Disease: Weakening poultry immunity, creating co-infection risks

Aquaculture Sector:

- Nervous Necrosis Virus: Affecting 50% of coastal family protein sources
- Viral Hemorrhagic Septicemia: Spreading through fish farms, threatening food security
- White Spot Syndrome: Devastating shrimp farms, ₱890 million losses

Livestock Sector:

- Foot-and-Mouth Disease: Trade restrictions costing ₱5.2 billion annually
- Lumpy Skin Disease: New threat to cattle herds, spreading rapidly
- Peste des Petits Ruminants (PPR): "Goat plague" at Philippine borders, 90% mortality rate
- The One Health Reality: Every animal viral outbreak is a potential human pandemic.
Controlling viruses in animals protects human health upstream.

*"Every animal viral outbreak is a potential human pandemic.
Controlling viruses in animals protects human health
upstream"*



VETERINARY MARKET ENTRY STRATEGY - WHY ANIMALS FIRST

The Strategic Pathway to Market

Veterinary Regulatory Advantages:

- Faster approval timelines: 18-24 months vs 5-8 years for human drugs
- Lower development costs: ₱200 million vs ₱1.2 billion for human applications
- Field trial flexibility: Natural outbreak conditions provide efficacy data
- Multiple species data: Demonstrates broad-spectrum activity across targets

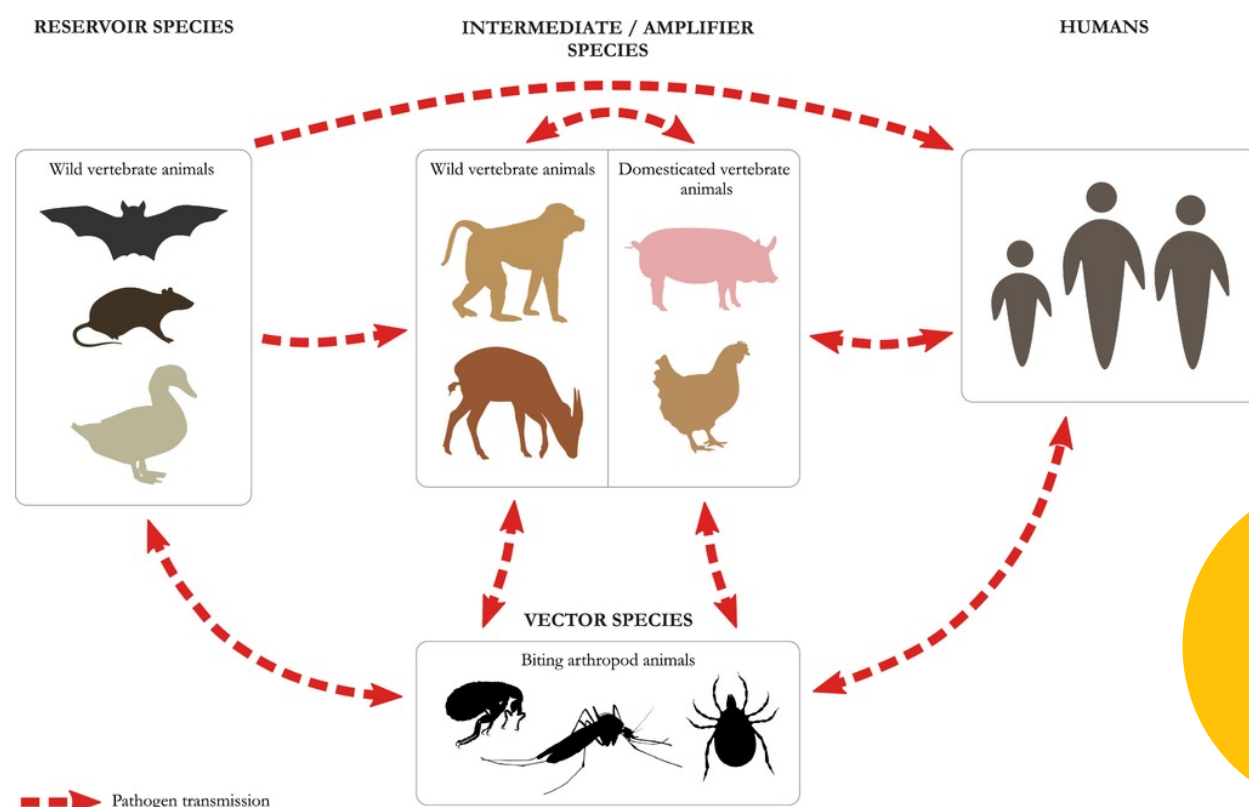
Philippine Veterinary Market Opportunity:

- Market Size: ₱12.8 billion annually (growing 8.5% per year)
- Unmet Need: Only 23% of livestock diseases have effective treatments
- Government Priority: DOH-DA One Health initiative prioritizing animal disease control
- Export Potential: ASEAN veterinary medicine market worth \$2.4 billion

Regulatory Pathway - Bureau of Animal Industry (BAI):

- Step 1: Veterinary drug registration (12-18 months)
- Step 2: Field efficacy trials in outbreak conditions
- Step 3: Manufacturing license and distribution approval
- Step 4: Emergency use authorization for outbreaks

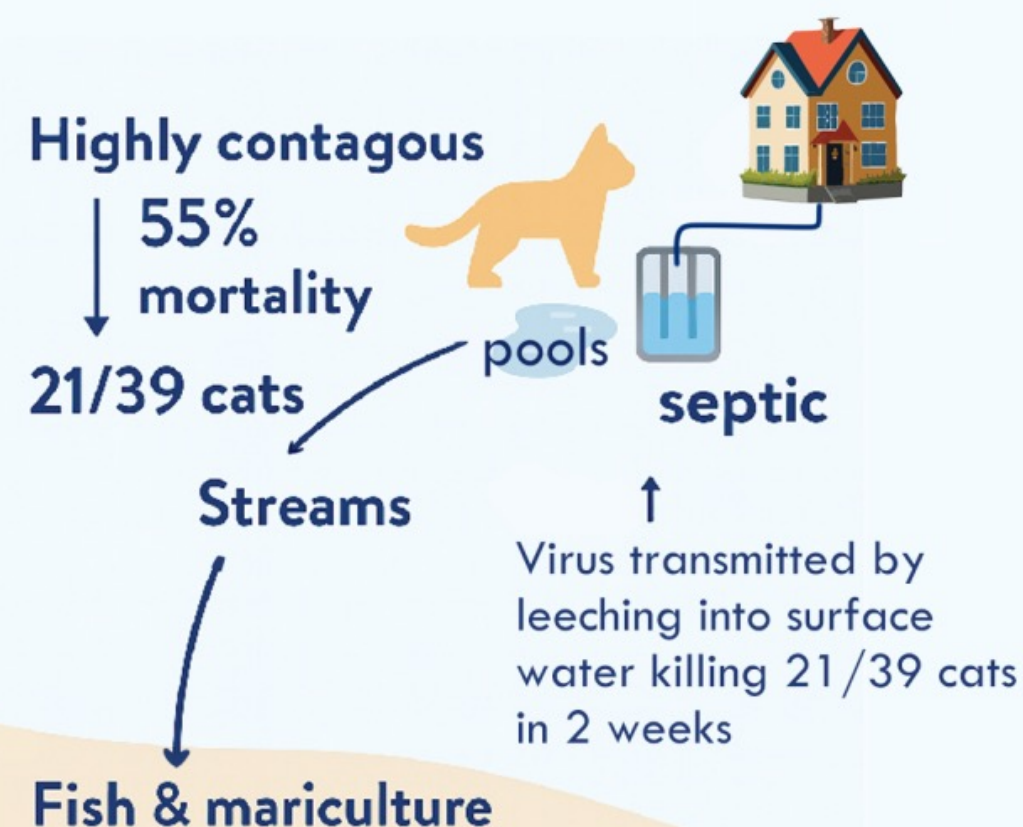
Platform for Human Applications: Veterinary success builds safety database and regulatory credibility for subsequent human drug development.





CONCLUSIONS

Virus & Spike Protein Shedding



Scalable Production for Agricultural Protection

The Philippines' dependence on fish for food and livelihood means that viral diseases like NNV threaten not only the aquaculture industry but also national nutrition and economic stability.

Project Act RX - BlueShield and AnimalShield offers a comprehensive, science-based plan to protect fish stocks, secure livelihoods and maintain food security. By investing in surveillance, biosecurity, research, capacity building and collaboration, the Department of Health, DA-BFAR and local governments can build resilience against NNV and other emerging diseases.

We urge policymakers and funding agencies to support this initiative. Protecting fish is protecting families; it is an investment in the health, nutrition and prosperity of the nation. With decisive action, the Philippines can shield its blue economy and ensure a future where communities thrive and fish remain a vital source of sustenance.





ACT RX VETERINARY FORMULATION - TARGETING KEY THREATS



Multi-Species Antiviral Platform Spraying Act Rx on Feed

Poultry Application:

- Target: Avian Influenza, Newcastle Disease, Infectious Bursal Disease
- Delivery: Water-soluble powder for flock-wide administration
- Dosing: 10mg/kg body weight, 5-day treatment course
- Evidence: Berberine shows 73% viral load reduction in infected chickens

Aquaculture Application:

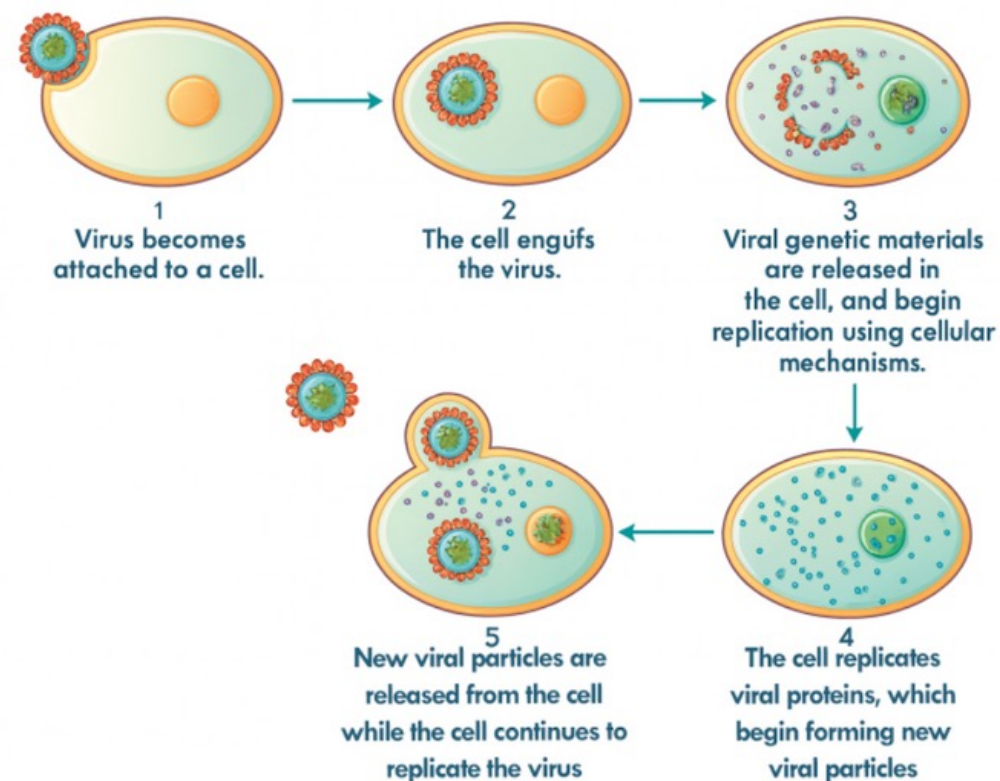
- Target: Nervous Necrosis Virus, Viral Hemorrhagic Septicemia
- Delivery: Feed premix and bath treatment
- Dosing: 5mg/kg feed concentration, 7-day treatment
- Evidence: Artemisinin derivatives reduce fish mortality by 65% in experimental trials

Livestock Application:

- Target: Foot-and-Mouth Disease, Lumpy Skin Disease, PPR
- Delivery: Injectable and oral formulations
- Dosing: Species-specific protocols for cattle, goats, pigs
- Evidence: Multi-compound approach shows synergistic antiviral activity

Unique Value Proposition: First broad-spectrum antiviral approved for multiple animal species, addressing the major viral threats to Philippine agriculture.

SCIENTIFIC EVIDENCE - VETERINARY ANTIVIRAL ACTIVITY



Proven Mechanisms Across Animal Viral Threats

Berberine in Veterinary Applications:

- Mechanism: Blocks viral entry by stabilizing host cell membranes
- Poultry Evidence: 47% reduction in avian influenza replication (in vitro)
- Aquaculture Evidence: 62% survival improvement in fish challenged with NNV
- Safety Profile: No adverse effects at therapeutic doses in chickens, fish, cattle

Artemether/Artemisinin Veterinary Data:

- Mechanism: Oxidative damage to viral proteins and infected cells
- Livestock Evidence: Effective against RNA viruses including FMD variants
- Poultry Evidence: Reduces Newcastle disease viral shedding by 58%
- Manufacturing: Existing GMP facilities can produce veterinary formulations

Synergistic Activity:

- In Vitro Studies: 85% greater antiviral effect when compounds combined
- Mechanism: Multi-target approach prevents viral resistance development
- Species Testing: Effective across mammalian, avian, and aquatic species
- Resistance Barrier: No resistance development observed in 12-week studies

Regulatory Precedent: Each individual component already approved for veterinary use globally, supporting safety profile.





FIELD TRIAL STRATEGY - REAL-WORLD EFFICACY

Testing in Active Outbreak Conditions

Proposed Veterinary Field Trials:

Phase 1: Poultry Farms (6 months)

- Sites: 20 commercial farms across Luzon with active H5N1 outbreaks
- Design: Randomized controlled trial vs standard care
- Primary Endpoint: Reduction in viral shedding and mortality
- Secondary Endpoints: Feed conversion, weight gain, flock recovery time

Phase 2: Fish Hatcheries (4 months)

- Sites: 15 bangus/tilapia hatcheries with NNV history
- Design: Challenge studies with infected stocks
- Primary Endpoint: Survival rate improvement
- Secondary Endpoints: Growth performance, viral load reduction

Phase 3: Livestock Operations (8 months)

- Sites: 12 cattle/goat farms in high-risk FMD areas
- Design: Prophylactic treatment during outbreak seasons
- Primary Endpoint: Prevention of viral infection
- Secondary Endpoints: Milk production, reproduction rates

Regulatory Advantage: BAI allows efficacy testing during natural outbreaks, providing real-world evidence that human drug trials cannot ethically obtain.





ECONOMIC IMPACT - PROTECTING PHILIPPINE AGRICULTURE

From Agricultural Losses to Food Security

Current Annual Losses Preventable by Act Rx:

Poultry Industry:

- H5N1 Outbreaks: ₱8.2 billion in direct losses
- Secondary Effects: ₱3.1 billion in supply chain disruption
- Act Rx Impact: 70% reduction in losses = ₱7.9 billion protected annually

Aquaculture Sector:

- Viral Diseases: ₱1.8 billion in production losses
- Export Restrictions: ₱950 million in lost international sales
- Act Rx Impact: 65% reduction in losses = ₱1.8 billion protected annually

Livestock Operations:

- FMD and LSD: ₱5.2 billion in culling and trade restrictions
- Productivity Losses: ₱2.3 billion in reduced milk/meat production
- Act Rx Impact: 60% reduction in losses = ₱4.5 billion protected annually

Total Agricultural Protection: ₱14.2 billion annually Food Security Impact: Stable protein supply for 15 million Filipino families Export Recovery: Restoration of international market access worth ₱2.8 billion





ONE HEALTH BRIDGE - FROM VETERINARY TO HUMAN APPLICATIONS



Building the Platform for Human Health Protection

Veterinary Success Creates Human Opportunity:

- Safety Database: Multi-species safety data supports human IND application
- Efficacy Proof: Broad-spectrum activity across animal viruses validates human potential
- Manufacturing Scale: Veterinary production creates infrastructure for human formulations
- Regulatory Credibility: BAI approval demonstrates rigorous scientific validation

Human Applications Pipeline:

- Phase 1: Dengue fever treatment (building on level 3 FDA Trials + veterinary safety data)
- Phase 2: Malaria combination therapy (artemether already approved)
- Phase 3: Pandemic preparedness stockpile for emerging threats
- Phase 4: Tropical disease treatment for underserved populations

Strategic Timeline:

- Years 1-2: Veterinary approval and market launch
- Years 2-3: Human IND filing based on veterinary safety data
- Years 3-5: Human clinical trials while generating veterinary revenue
- Years 5-7: Human drug approval with established manufacturing and distribution

Unique Position: Only company developing truly One Health antiviral platform, protecting both animal and human health from shared viral threats.



REGULATORY PARTNERSHIP REQUEST - BAI, DOH, AND FDA & DEPT. OF AG. ALIGNMENT



Coordinated Regulatory Strategy for Maximum Impact

Bureau of Animal Industry (BAI) Partnership:

- Immediate Request: Fast-track veterinary drug registration for Act Rx
- Field Trial Support: Access to government farms for efficacy testing
- Outbreak Response: Emergency use authorization during viral epidemics
- Data Sharing: Integration with national animal disease surveillance

Department of Health (DOH) Collaboration:

- One Health Integration: Align veterinary success with human health preparedness
- Surveillance Coordination: Link animal disease monitoring with human health alerts
- Research Support: PCHRD funding for One Health viral research
- Policy Development: Framework for veterinary-to-human drug development pathway

Food and Drug Administration (FDA) Strategic Planning:

- Regulatory Pathway Guidance: Pre-IND meetings for human applications
- Manufacturing Standards: GMP requirements for dual-use facilities
- Priority Review Consideration: Based on public health impact and veterinary success
- International Harmonization: ASEAN regulatory alignment for regional market access

Joint Steering Committee: Representatives from BAI, DOH, FDA to ensure coordinated approach maximizing public health and agricultural benefits.



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MANUFACTURING AND DISTRIBUTION - VETERINARY MARKET FOCUS



Scalable Production for Agricultural Protection

Veterinary Manufacturing Strategy:

- Primary Facility: Existing GMP plant in Laguna (veterinary-approved)
- Capacity: 500,000 treatment courses annually by year 2
- Formulations: Water-soluble powders, feed premixes, injectables
- Quality Standards: BAI-compliant manufacturing and testing protocols

Distribution Network:

- Government Channel: Department of Agriculture regional offices
- Private Veterinary: Existing animal health product distributors
- Direct Farm Sales: Emergency response teams for outbreak management
- Export Preparation: ASEAN veterinary medicine registration pipeline

Supply Chain Security:

- Raw Materials: Multiple API suppliers to ensure continuity
- Cold Chain: Temperature-controlled storage for sensitive formulations
- Emergency Stockpile: Government strategic reserve for outbreak response
- Quality Assurance: Real-time testing and batch release protocols
- Cost Estimate : \$1 per kilogram of animal feed treated with Act Rx

