



Sustainability Veterinary in the Era of Green Transformation

AKSORN SAENGTIENCHAI DVM PHD

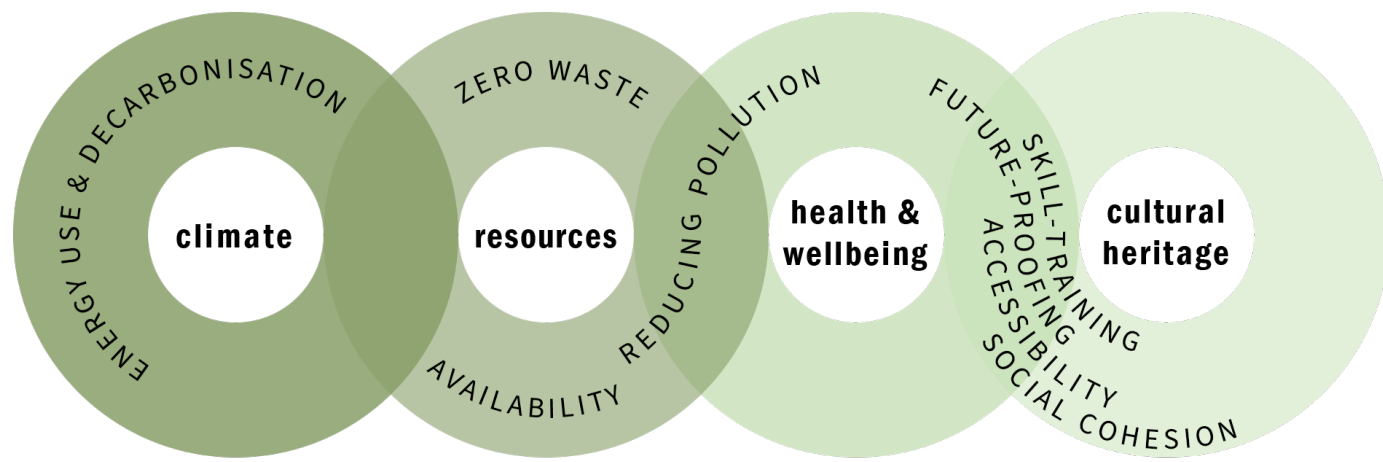
DEPARTMENT OF PHARMACOLOGY, FACULTY OF VETERINARY MEDICINE

KASETSART UNIVERSITY, THAILAND

FVETASC@KU.AC.TH



Green Transformation



<https://gogreenconservation.eu/>

KU 80
มหาวิทยาลัยเกษตรศาสตร์
ประกาศเดินหน้าขับเคลื่อน
สู่ความเป็นกลางทางคาร์บอน
(Carbon Neutrality)
อย่างมีส่วนร่วม ภายในปี 2035

ดร.จารึก วัชรภักดิ์
อธิการบดีมหาวิทยาลัยเกษตรศาสตร์
ประกาศ ณ วันที่ 1 ตุลาคม 2566

KU
Carbon Neutrality
ความเป็นกลางทางคาร์บอน
จุดเริ่มต้นเล็กๆ
...สู่โลกที่ยั่งยืน

<https://www.ku.ac.th/>

Carbon Neutrality
Faculty of Environment

1. Waste minimization
ลดการปล่อยของเสีย
การคัดแยกขยะ
การนำขยะไปใช้ประโยชน์

2. Appropriate technology for waste management
ลดการฝังกลบ
ลดการเผาไหม้
การบำบัดน้ำเสีย

3. Waste utilization
การนำขยะไปใช้ประโยชน์
การนำขยะไปผลิตเป็นพลังงาน
การนำขยะไปผลิตเป็นวัสดุ

Smart building for low carbon emission
การออกแบบอาคาร
การก่อสร้างอาคาร
การดำเนินงานอาคาร

KU green mobility for low carbon campus
การเดิน
การขี่จักรยาน
การขี่รถจักรยานยนต์
การขับรถ



Why sustainability matters in veterinary medicine?

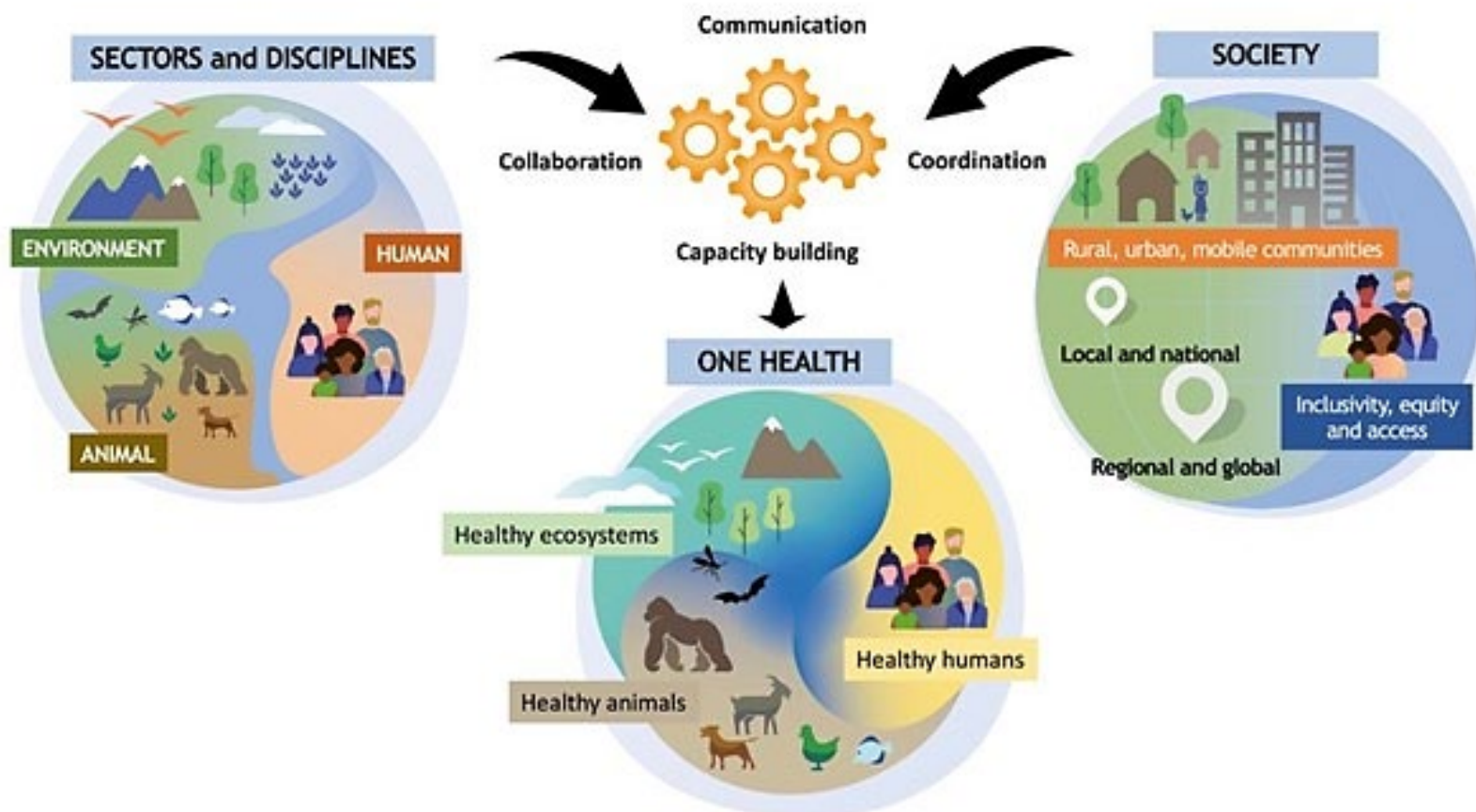
- Global challenges:
 - Climate change
 - Biodiversity loss
 - Antimicrobial Resistance (AMR)
 - Food insecurity
- Transition toward sustainable and circular economies
- The role of science and innovation in this transformation



Changing Expectations in the Veterinary Field: from the 1980s to the Green Transformation

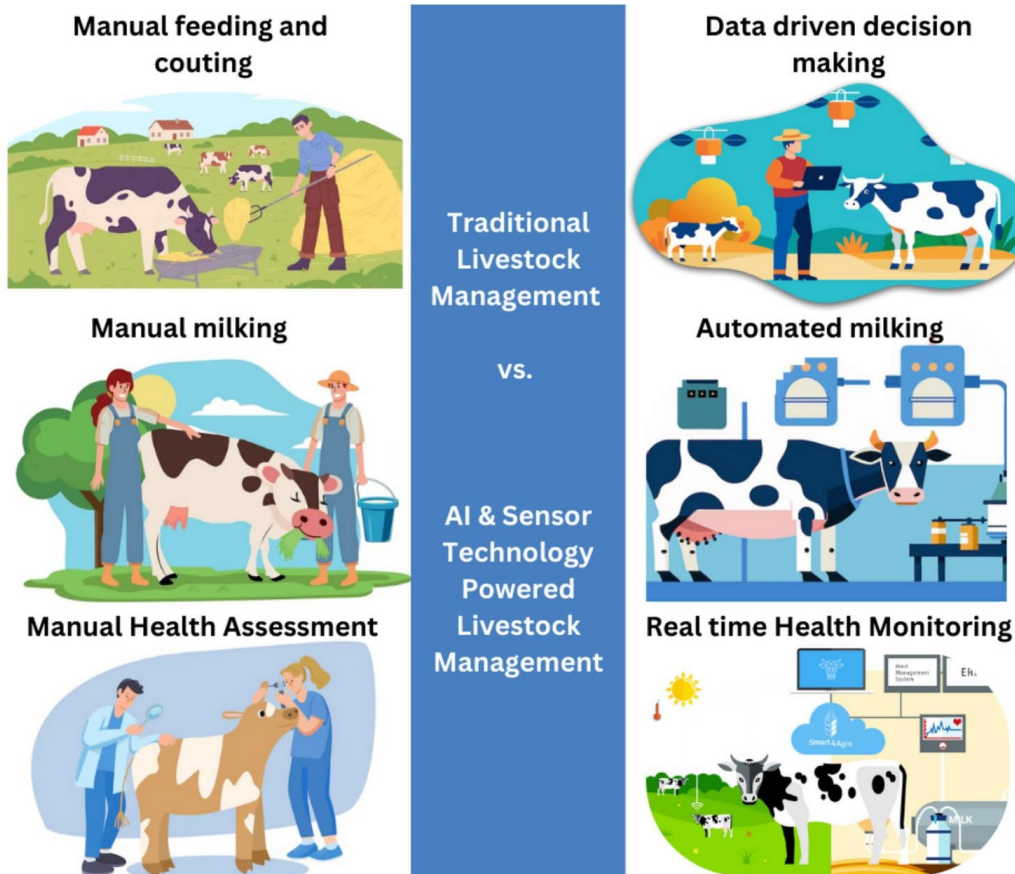
Topics	1980s Era	Green Transformation Era
Veterinary Perspective	Focused on <i>animal health</i> and disease control.	Emphasizes <i>One Health</i> — linking humans, animals, and the environment.
Technology and Practice	Basic tools: X-ray, vaccines, conventional drugs.	Digital tools: AI, telemedicine, biosensors, precision farming, blockchain.
Environment	Rarely discussed in veterinary work.	Focusing — green clinics, waste reduction, lower carbon footprint.
Livestock	Productivity-driven; high resource use.	Sustainable production using digital tools, nutrition, and rational drug use. (RDU)
Social Role	Worked in silos: clinical, government, industry.	Interdisciplinary collaboration and integration across sectors.
Core Concept	“Treat and prevent animal diseases.”	“Balance health, environment, and economy.”
Global Policy Context	No global sustainability goals.	Aligned with SDGs and WOA. H.

From Animal Health to One Health



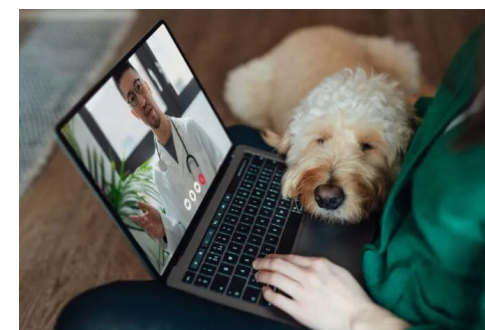
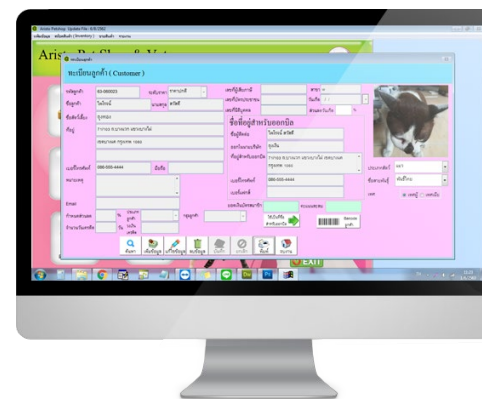
- Prevent outbreaks of zoonotic disease in animals and people.
- Improve food safety and security.
- Reduce antimicrobial-resistant infections and improve human and animal health.
- Protect global health security.
- Protect biodiversity and conservation.

Technological Transformation



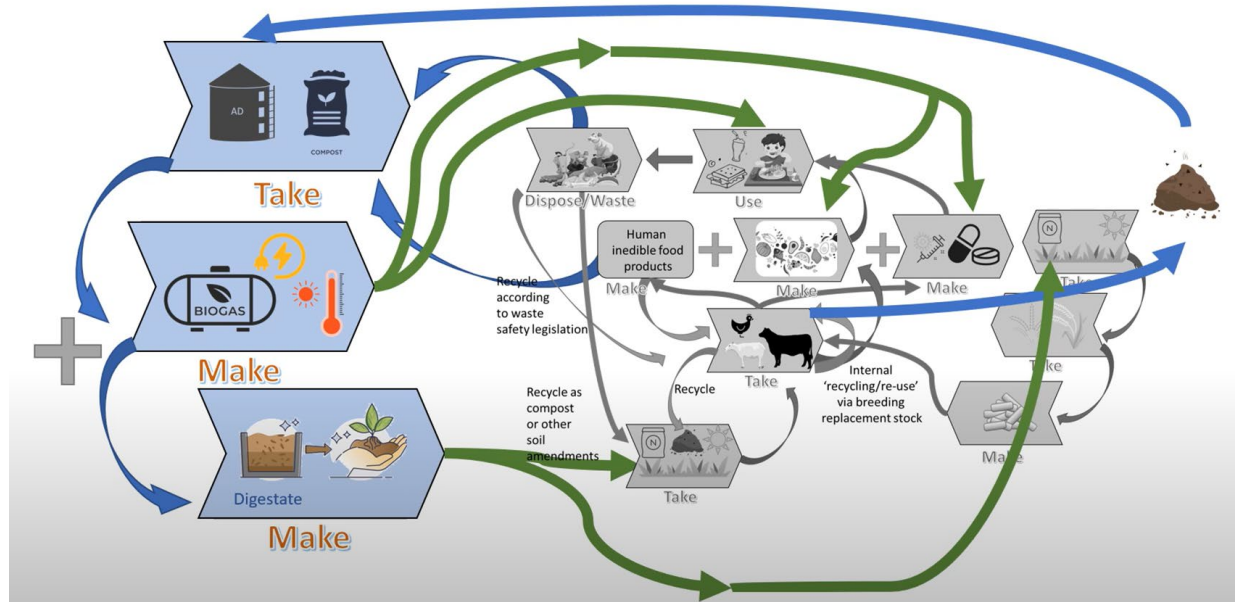
From tradition to precision in cattle farming.

- AI and data analytics in diagnostics and disease prediction.
- Precision Livestock Farming and smart sensors.
 - Monitoring technologies enable real-time monitoring.
- Digital health records and tele-veterinary services.



Sustainable Livestock Production

- Transition from high-output to low-carbon, resource-efficient systems
- Manure and waste management, circular economy approach
- Precision feeding, animal welfare, and climate-smart farming



<https://businesswales.gov.wales/>

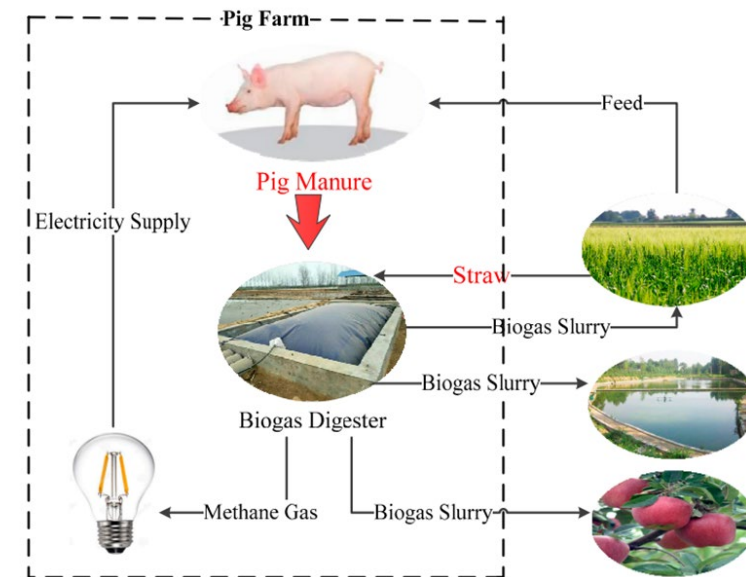


Figure 1. Framework of agricultural-waste recycling in pig farm.

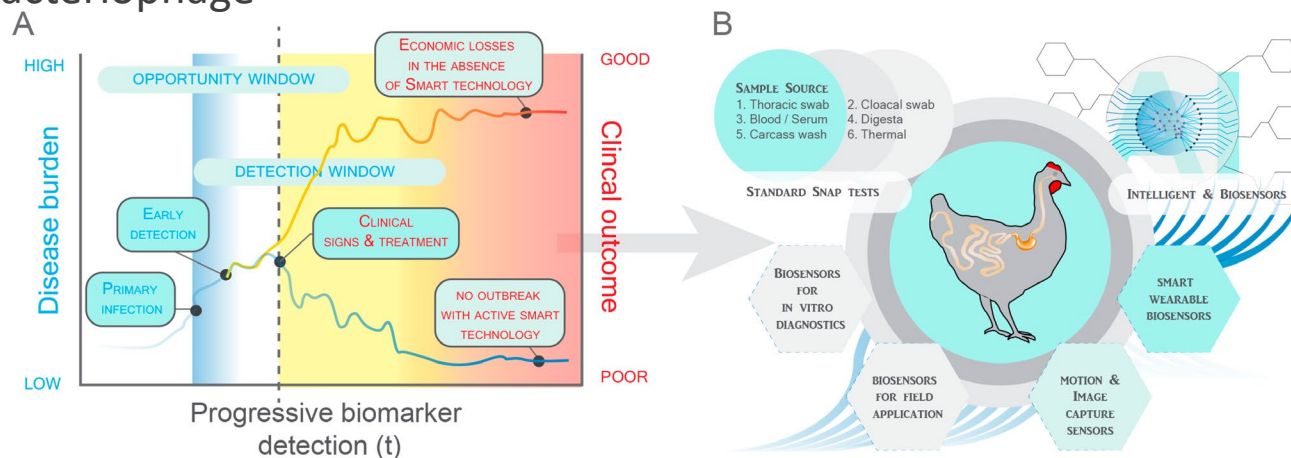
Sustainability 2021, 13(10), 5515

Rational Use of Veterinary Drugs

- Concept of Antimicrobial Stewardship and Policy
- Responsible use → prevention of AMR
 - Innovation: Probiotic, Prebiotic, Vaccine, Autogenous vaccine
 - Alternatives: Phytobiotic, Organic acid, Immunostimulant, Bacteriophage



- Incentives for drug management and resistance surveillance
 - AI tools: Sensors
 - Reducing Antibiotics Use in Farm (RAU) and Raised Without Antibiotics Farm (RWA)
 - BCG: Bioeconomy, Circular Economy, and Green Economy



The early detection problem. (A) The challenge of early detection stems from the scarcity of biological elements or biomarkers indicative of disease onset. (B) The choice of sample source is pivotal for early disease detection.

Role of AI & Digitalization

- Data-driven decision-making in animal health
- Machine learning for disease forecasting
- Smart farms and remote monitoring
- Digital twins and AI-supported education tools

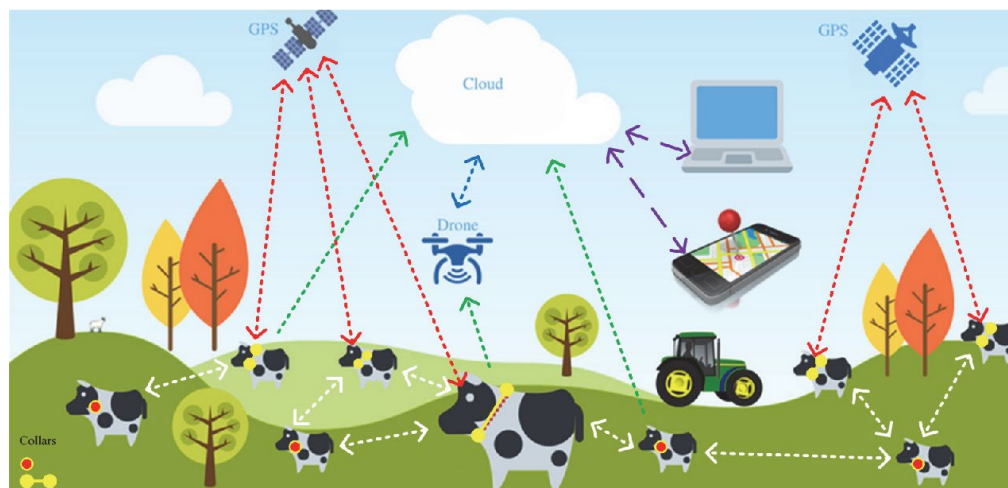


Fig. 1. System architecture for livestock tracking.
Telfor Journal, Vol. 10, No. 2, 2018.

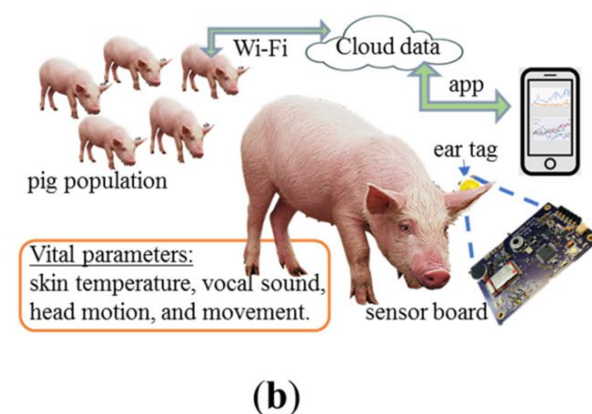
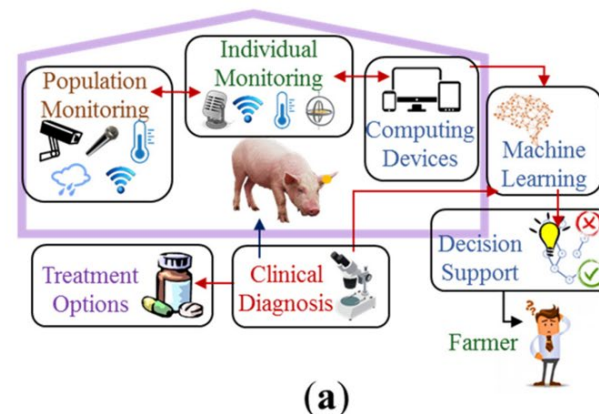


Figure 1. Overall theme for behavioral health monitoring in pig farms: (a) the pig farm is equipped with technologies to monitor individual animals and populations with mobile devices, data computing and storage units, machine learning, decision support tools, clinical diagnosis, and treatment options; (b) our measurement setup is shown. The ear tag with sensor board is attached to the ear lobe of individual pigs to measure vital parameters and send the data through a smartphone app to the cloud.

Animals 2021, 11(9), 2665

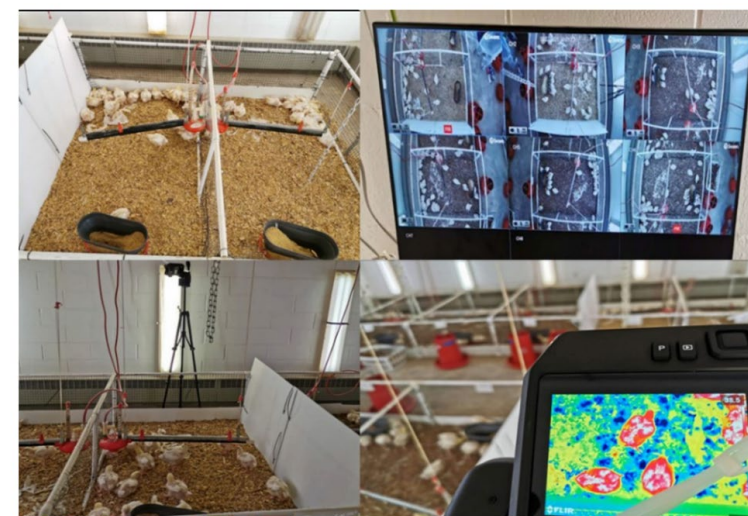
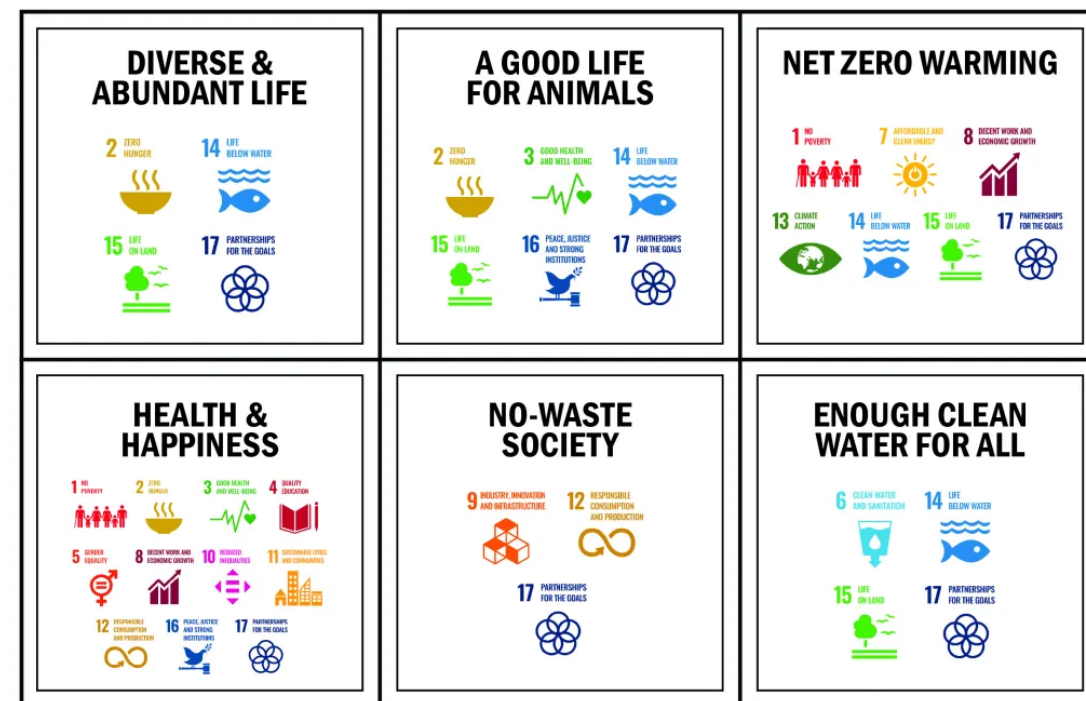


Figure 4. An integrated imaging method for monitoring broilers'.

The University of Georgia College of Agricultural and Environmental Sciences © 2012-2025. All Rights Reserved

Sustainable Veterinary Practice

- Principles: reduce waste, energy efficiency, and eco-friendly clinics.
- Carbon footprint reduction in veterinary operations.
- Examples: green clinic design, paperless systems, renewable energy use.



<https://veterinarysustainabilityalliance.org>



Veterinary Education in Transformation

- Veterinary schools must evolve to meet sustainability goals
- From “knowledge transfer” → “competency-based, system-oriented learning”
- Integration of sustainability across disciplines



<https://www.aavmc.org/resources/competency-based-veterinary-education/>



<https://www.rnz.co.nz/news/national/520848/innovative-fake-cows-and-sheep-net-award-for-vet-teachers>

Teaching and Learning Innovations

- Problem-Based and Case-Based Learning (PBL/CBL)
- Experiential learning: fieldwork, smart farms, green labs
- Virtual simulations & AI-assisted training tools
- Learning by doing → “Sustainability in action”



Students don virtual reality headsets at Texas A&M University.



Colorado State University uses virtual tools to reduce reliance on cadavers.

<https://todaysveterinarypractice.com/technology/how-technology-is-transforming-veterinary-education/>

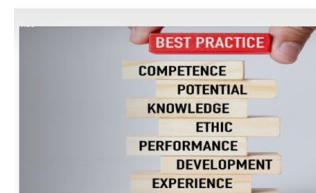


Globalized and Sustainable Curriculum

- Align with WOAHA, AVMA, AVBC, EAEVE standards
- Include new courses:
 - Climate Change & Animal Health
 - Sustainable Food Systems
 - AI in Veterinary Science



WHO WE ARE ▾ WHAT WE DO ▾ WHAT WE OFFER ▾ MEDIA ▾



E-LEARNING
OIE Training Portal

> Read more



OIE PPP E-LEARNING COURSE
Public-Private Partnerships: Opportunities for
Progressive Control of Transboundary Animal
Diseases

> Read more



OIE-WAHIS E-LEARNING COURSE
E-learning training platform for OIE-WAHIS

> Read more

- Emphasize “Global Standard, Local Relevance”

New Veterinary Competencies

Skill Area	Description
Digital & AI Literacy	Data analytics, AI-assisted diagnosis
Sustainability Thinking	Environmental & ethical awareness
Systems Thinking	Integrating animal–human–ecosystem health
Collaboration	Working with multidisciplinary teams
Policy & Leadership	Influence sustainable animal health policies



Faculty and Institutional Readiness

- Faculty development in digital pedagogy & sustainability education
- Cross-department collaboration (Vet – Engineering – Environment)
- Green Campus initiatives and sustainable operations





Research and Innovation for Sustainability

- Focus areas: AMR, waste-to-energy, climate-resilient livestock
- AI applications for animal welfare and disease prevention
- Partnerships with FAO, UNEP, DLD, and local communities
 - FAO – Regional value chain analysis
 - DLD – Regulators and enforcers
 - Local communities – Sharing knowledge and technology
- Technology-driven surveillance enhances engagement with target groups through effective, data-based communication and affective impact.
- Transdisciplinary collaboration across multiple sectors—government, academia, and private—supports integrated, multi-level actions for sustainable outcomes.



Policy and Leadership Roles

- Veterinarians play a vital role in shaping green policies and advancing sustainable livestock production under the One Health framework.
- Emphasis on reducing carbon footprints through free-range or low-stress farming systems that enhance animal welfare.
- Holistic approaches to disease prevention and control require collaboration across multiple sectors and stakeholders.
- Key partners include the DLD, Department of National Parks, zoological institutions, and diagnostic laboratories.
- Scientific-based, multi-sectoral cooperation at national and regional levels ensures policy alignment, workforce efficiency, and sustainable outcomes.



Curriculum Transformation at VET KU

Doctor of Veterinary Medicine (DVM) Program Revised Curriculum, B.E. 2568 (2025)

The curriculum integrates essential veterinary knowledge and skills with increased workplace-based learning, enabling students to apply theory in real-world settings across animals, farms, and communities.





Curriculum Transformation at VET KU

Year 1

Year 2

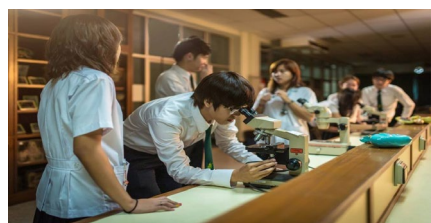
Year 3

Year 4

Year 5

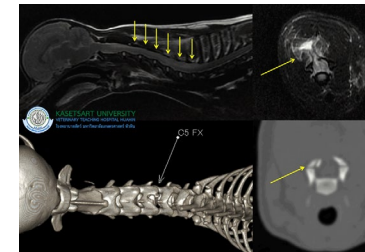
Year 6

Preclinical foundation in animal biology, disease mechanisms, and diagnostics.



Pharmacology, epidemiology, medical imaging analysis, disease control.

Companion animal medicine, surgery, and obstetrics with clinical training.



Clinical training in medicine, surgery, and obstetrics of production animals, equine, and wildlife to broaden clinical expertise.



Veterinary public health and clinical rotations in major disciplines, including small animals, large animals, and aquatic species.

Advanced clinical practice through: Specialized Clinical Training and Work-Integrated Learning (WIL)

Curriculum Transformation at VET KU

- Skill Lab
- Paperless examination: KULam (Learning Assessment Management)
- Objective Structured Clinical Examination (OSCE)



Facilities and Safety Transformation at VET KU



Biosafety Standards



Student Laboratory Safety Manual



**Guidelines for Student Conduct
in Laboratory Classes**



**Fire Prevention and
Suppression Plan - Faculty**



**Fire Evacuation Plan
- KUVTH BK**



**Procedure for Chemical, Hazardous,
and Infectious Waste Management**



**Fire Prevention and Suppression Plan,
Kamphaeng Saen Campus**

- Fire safety
- Solar Cell System
- Wastewater treatment system
- Emergency response system
- Building strength and earthquake resistance
- Room reservation system

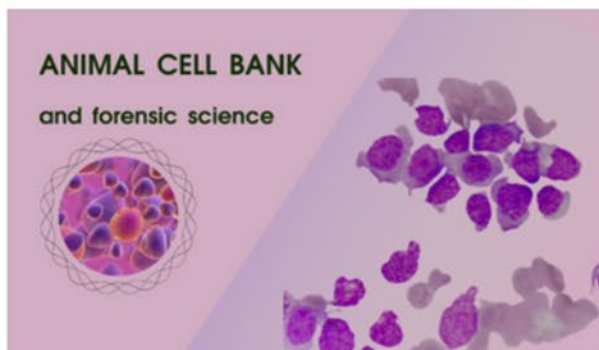
<https://vet.ku.ac.th/veten/>

Research and Innovation at VET KU



Center for Veterinary Research and Innovation

<https://researchvetku.com/>





Take Home Messages

Towards a Green and Sustainable Veterinary Future

- The future of veterinary medicine depends on **green transformation** and holistic collaboration for people, animals, and the planet.
- Integrating **sustainability, AI innovation, and the 3Rs** in education empowers veterinarians to lead meaningful change.
- Together, we build a **One Health–based, resilient, and environmentally responsible world.**



Thank you for your attention
ขอบคุณค่ะ