Zoonotic Emergency Preparedness & Intervention essential for a sustainable animal production

Dr. Martin C.Th. Scholten
15 September 2020

with contributions from Wim van der Poel, Mart de Jong, Jeroen Kortekaas, Annemarie Rebel, Andries Koops, Frank van Langevelde, Willem Jan Knibbe, Roel Jongeneel, Petra Berkhout & Krijn Poppe
GASL From Crisis to Action – Lessons from COVID-19 for Building a Better Future through Sustainable Livestock

Take-stock of impacts of pandemic on four areas of development and the role of livestock

1. Food and nutrition security (Michael Lee)
2. Livelihoods and economic growth
3. Animal health and welfare (Stefano Messori)
4. Climate and natural resource use
Future Food System: Connected Circularity

Food Security

Resource Security
Livestock is criticized, but essential

The role of livestock is:
1) to convert non-food biomass in nutritious food,
2) to produce circular, natural fertilizers produced from manure.

In this role livestock also provide agroecological services.
Connected Circularity is Climate Smart

GHG (Agri) Emissions Netherlands (mTon CO2 eq/year)

Manure: valorisation as compost (feces fraction) and mineral concentrates (urine fraction) saving use of artificial fertilizers

Feed: using 100% forage and coproducts from crop residues and food in animal feed instead of producing and importing specific feed crops;

Crops: changing land use with a focus on mixed food with feed production instead of separate one-culture food and feed crop production land.

2050 = what can be achieved with standard mitigation measures
Connected circularity with livestock requires safety by design from a One Health Perspective
SOCIETAL CONCERNS RELATED TO LIVESTOCK

Public health concerns related to antimicrobial resistance and zoonotics
Next to concerns about animal stewardship, climate action and footprint

- Intensive connectivity with Society: hot spot concentrations
- Global connectivity by international trade
Disease X: a Zoonotic SARS-CoV-2 Virus causing the COVID-19 Pandemic, what’s next?
A pandemic like Covid-19 is a major disruptor

Major external worldwide disruptors

- Less funding for international institutions and programmes
- Private funding with more focus on economic restoration and subsequent shifts in the economy
- Outsourcing of innovation by multinationals
- Preventive One Health will be a priority next to sustainability in food security related research and innovation
- Geopolitical powershifts between countries/continents and new interdependencies
- More complex international collaboration with less commitment to investment in international institutions
- Stricter global One Health policies

- More online education/less face-to-face education
- More flexibility in content (modularisation) and time/duration (micro-credentials, ‘best buy’)
- Shift in students’ decisions to select educational programmes
- Less global human capital drain by decrease in international staff inflow (8.3)
- Personal safety standards for employees
- More emphasis on regionalism
- Less global trade, more trade barriers, increased self-sufficiency of the continents
- New requirements for healthy environment and logistics; importance of pricing in externalities
- Stronger roles for governments, more autocracy
- Economic (re)development/recovery, increased dependency on IT and sustainability criteria

- Increase in travelling or work mobility
- Less international mobility of students and limited international research & projects
- More emphasis on regionalism
- Social distancing in the workplace, with a shift towards online work and online collaboration, review of facility/factory designs
- Different attitude regarding labour with limited immigrants, creating new opportunities for robotics
- Disrupted supply chains leading to changes from the optimised just-in-time cheapest manufacturing concept to local sourcing and more stock
- Sustainability, safety and transition towards circularity

Digitalisation
- Exponential speeding up of ICT developments for adaptive workspace (office/home), digital collaboration platforms and online businesses combined with support/training for changed skills of people
- Social distancing will lead to change in behaviour and choices
- Health and nutrition awareness will increase, obesity and suboptimal health status is considered even more seriously as a key risk factor, more consumption of fresh produce
- Hygiene awareness will rise with hygienic design of shops, products, processes, cleaning protocols, testing
Signals of short term economic consequences of Covid-19 on animal production sector

- EU Food System & EU Single Market are relatively resilient
- Food service related retail market under pressure
- Interference with consequences of AFS at world market
- Economic recession will result in reduced prices for meat and dairy

GLOBAL IMPACT COVID PANDEMICS
- 27 million confirmed cases, 1 million deaths
- 188 countries affected
- Economic loss of 500 billion€ per month
- Investment in producing > 2 billion vaccine doses
EU crisis policy framework

COVID-19 AFTERMATH: FORECAST

-5%
-10%
-15%
-20%
-25%
-30%

2020 2021 2022 2023 2024 2025 2026 2027

Financial impact

Time frame for 'No Regret' interventions

Time frame for 'Must Have' interventions

Time frame for 'Core Revision' interventions

Too late to make interventions
Others will decide

Duration of crisis

Public and private intervention
Farmer cash flow support
Restructuring of production

Market rebalancing
Automatic trigger mechanism
Directly/quickly effective
Separate budget

Farm survival
Political decision making
Requires targeting
Crisis reserve, state aid and/or other means

Structural adjustment
(product reduction)
Involves public and private stakeholders
Needs strategy approach
CAP budget
Scenario’s for longer term economic impact of Covid-19 on animal production sector

- **Business as Usual**
  - Role of the State: Unchanged
  - Behaviour: Unchanged
  - Regional Communities: Healthier and more sustainable
  - High Tech Transformation: Larger

- **Government Control**
  - Role of the State: Adaptive
  - Behaviour: Adaptive
  - Regional Communities: Robust
  - High Tech Transformation: Transformative

- **Business recovery in a free global market**
  - Preventive governmental control
  - Shift towards regional business models

- **Flipping the switch towards a radical transition by policies**
CONNECTIVITY: A GLOBAL ONE HEALTH

HOW BAD IS IT?

Contagiousness and lethality of airborne viruses

- Bird flu
- MERS
- SARS
- Spanish flu
- Hantavirus
- Smallpox
- Swine flu
- Measles
- Chickenpox/shingles
- Flu

People one person will infect in a completely susceptible population

Stage 1: Pre-emergence
- Encroachment into wildlife habitat
- Change in land use

Stage 2: Localised emergence
- Expansion of the wildlife-human being interface
  - Nipah virus
  - Ebola virus

Stage 3: Pandemic emergence
- International travel and trade
  - HIV/AIDS
  - Severe acute respiratory syndrome

*Estimate based on preliminary figures; Data: Philosophical Transactions of the Royal Society, World Health Organization, International Journal of Infectious Diseases, Centers for Disease Control and Prevention, Clinical Medicine & Research, Paediatric Respiratory Reviews, Emerging Infectious Diseases in Asia, Institute for Health Metrics and Evaluation, EMF Medicine, Epidemiology, informationsbeautiful.net
Disease X-next: Preparedness & Intervention

ZEPI: Zoonotic Emergency, Preparedness & Innovation

**Early Prediction**
- Wildlife as zoonotic reservoirs and dispersing agents
- Zoonotic transmission and propagation in society

**Preventive Intervention**
- Contingency planning
- Vaccin development
- Public health care

**Responsive Detection**
- Early hazard identification
- Real-time monitoring
- FAIR sharing of complex data
Understanding zoonotic emergencies requires an interdisciplinary approach.
As well as global connectivity in information

ZEPI: Zoonotic Emergency, Preparedness & Innovation

**Early Prediction**
- Global mapping of potential hotspots for emergence of zoonoses
- Global monitoring of presence, transition and dispersal of zoonoses
- Geographical modelling to forecast zoonotic infections

**Preventive Intervention**
- Sound and interconnected contingency plans
- Platforms for rapid vaccine development
- Capacity building for preparedness to intervene

**Responsive Detection**
- National infrastructures for data collection
- Tools for smart virome sequencing
- Toolbox for validated Point of Care Tests (PoCT)
- Integrated pandemic risk assessment models
Preparedness & Intervention of zoonotic emergencies requires concerted action
Prevent transfer through livestock: resilience by diversity, farming with care and rapid vaccination

CEPI

COVAX
Unlock interventive capacity of livestock: antiviral immune modulation by functional dairy proteins
Finding answers together