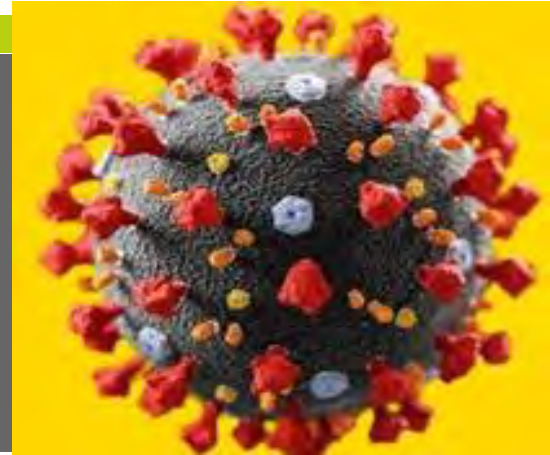


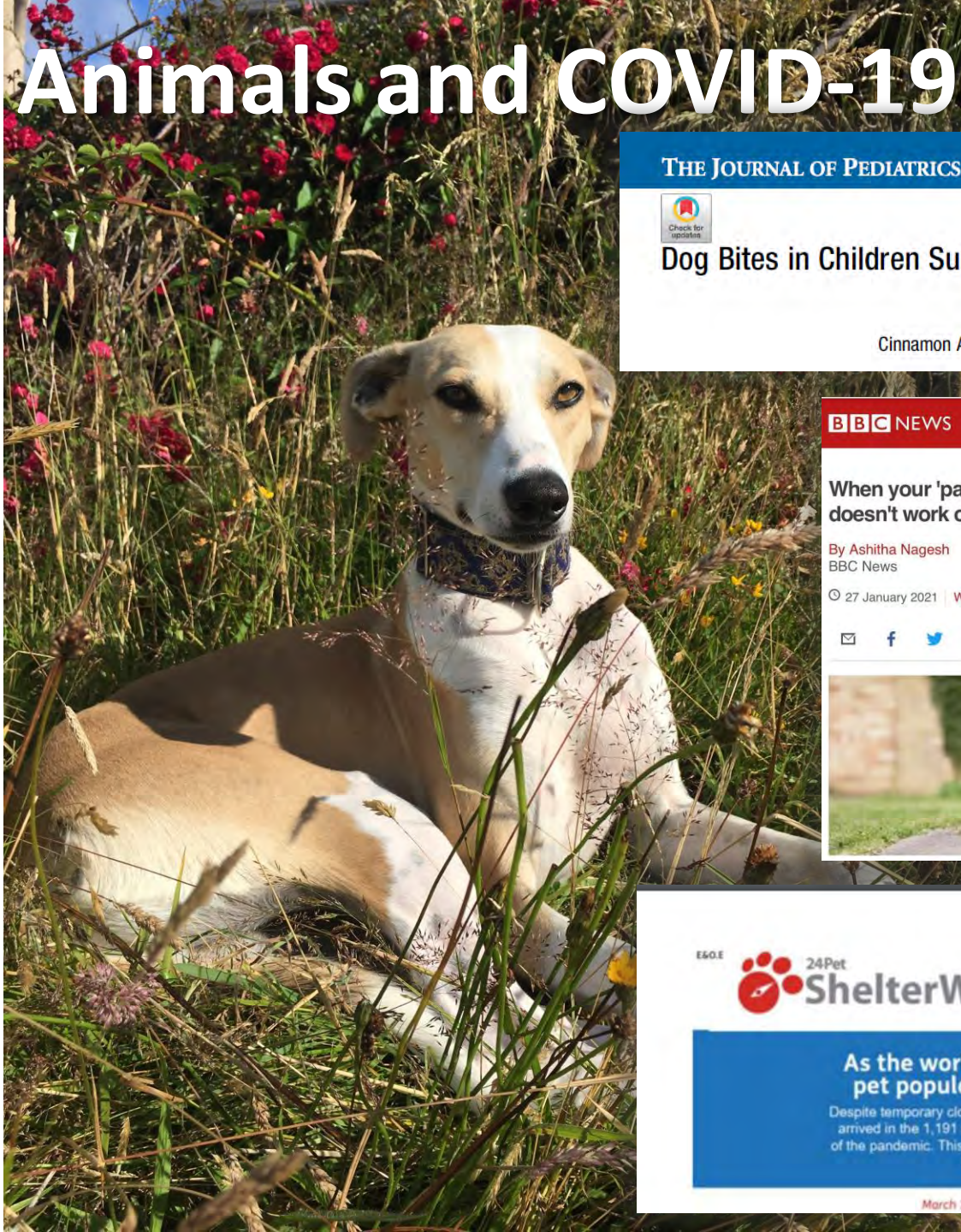
COVID-19 Effects on Livestock Production: A One Welfare Issue



Laura Boyle *M.Agr.Sc., Ph.D.*

Animal and Grassland Research and Innovation Centre, Moorepark,
Fermoy, Co. Cork, Ireland

Animals and COVID-19



Dog Bites in Children Surge during Coronavirus Disease-2019: A Case for Enhanced Prevention

Cinnamon A. Dixon, DO, MPH¹, and Rakesh D. Mistry, MD, MS²



EGOE



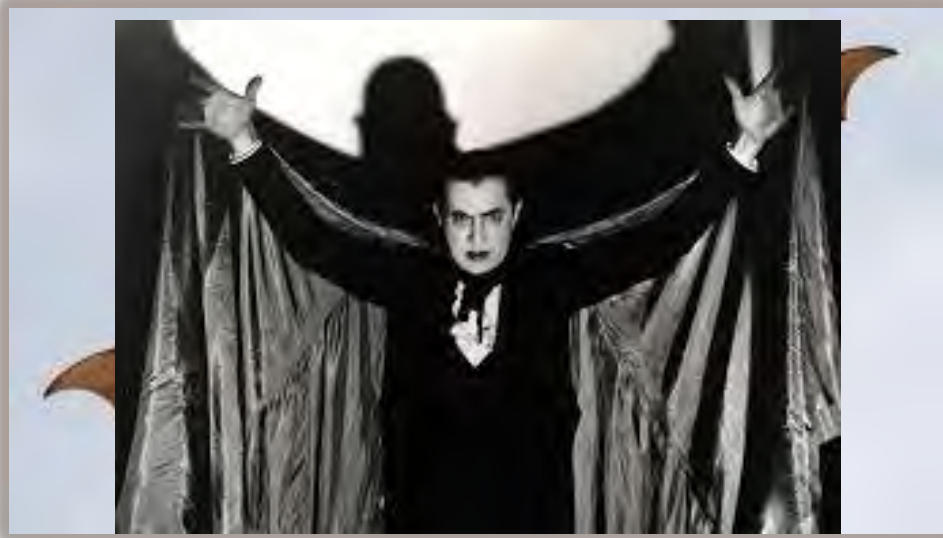
COVID-19 IMPACT

As the world navigates through a new reality, our pet population remains vulnerable and in-need.

Despite temporary closings and reduced shelter capacity, at least 798,789 new animals have arrived in the 1,191 shelters monitored by the 24Pet® ShelterWatch Report since the start of the pandemic. This number is expected to surge in the coming months with an anticipated increase in relinquished and abandoned animals.

March 13 - September 11, 2020 compared to the same period in 2019

Bats and COVID-19



 NATIONAL
GEOGRAPHIC

ANIMALS | WILDLIFE WATCH

'Wet markets' likely launched the coronavirus. Here's what you need to know.

Most of the earliest COVID-19 cases trace back to one of these sites, but

nature
communications

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Article | Open Access |
Published: 09 February 2021

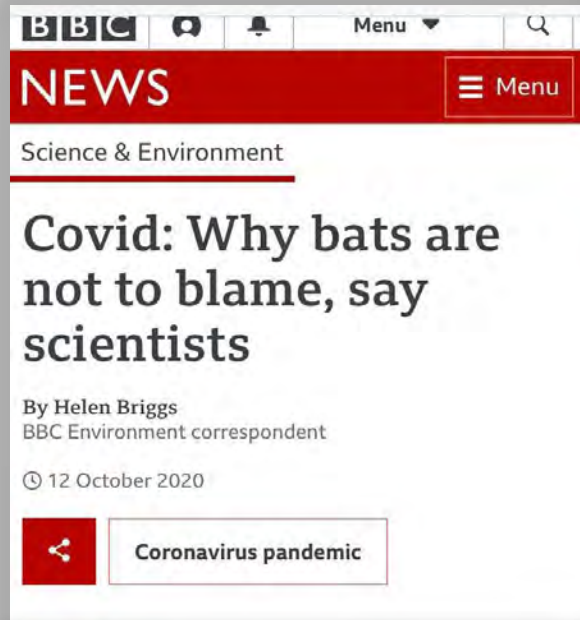
Evidence for SARS-CoV-2 related coronaviruses circulating in bats and pangolins in Southeast Asia

Supaporn Wacharapluesadee, Chee Wah Tan,
[...] Lin-Fa Wang 

Nature Communications 12,

Article number: 972 (2021) | [Cite this article](#)

Bats and COVID-19



BBC NEWS

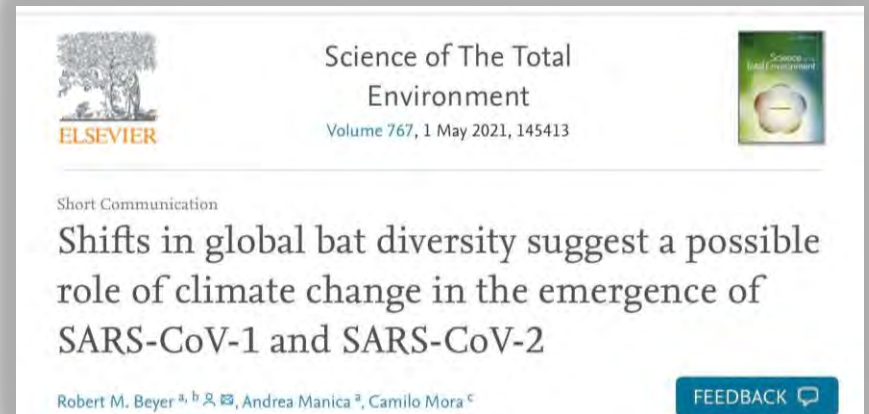
Science & Environment

Covid: Why bats are not to blame, say scientists

By Helen Briggs
BBC Environment correspondent

12 October 2020

Coronavirus pandemic



ELSEVIER

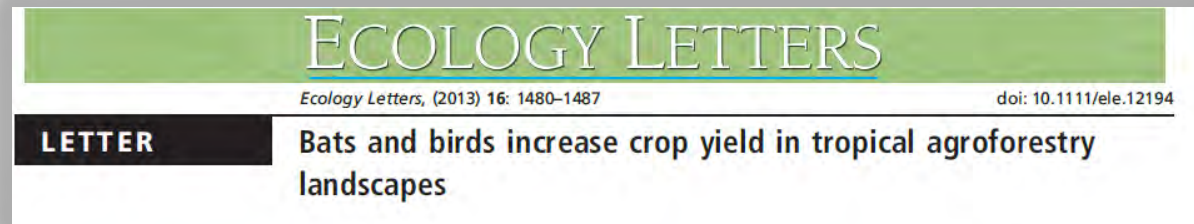
Science of The Total Environment
Volume 767, 1 May 2021, 145413

Short Communication

Shifts in global bat diversity suggest a possible role of climate change in the emergence of SARS-CoV-1 and SARS-CoV-2

Robert M. Beyer ^{a, b}, Andrea Manica ^a, Camilo Mora ^c

FEEDBACK



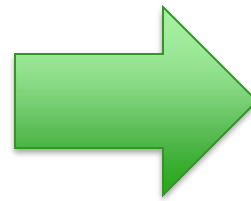
ECOLOGY LETTERS

Ecology Letters, (2013) 16: 1480–1487 doi: 10.1111/ele.12194

LETTER Bats and birds increase crop yield in tropical agroforestry landscapes

Our mental, physical, financial etc. health is connected to animals and through animals to our environment...

One Health



11,500 articles

147 articles

Contents lists available at ScienceDirect

ELSEVIER

One Health

journal homepage: www.elsevier.com/locate/oneht

From SARS to COVID-19: A previously unknown SARS- related coronavirus (SARS-CoV-2) of pandemic potential infecting humans – Call for a One Health approach

Mohamed E. El Zowalaty^{a,b,*}, Josef D. Järhult^c

Contents lists available at ScienceDirect

ELSEVIER

Applied Animal Behaviour Science

journal homepage: www.elsevier.com/locate/aplabeh

One welfare impacts of COVID-19 – A summary of key highlights within the one welfare framework[†]

Rebeca García Pinillos[†]

Covid-19: One Welfare effects on farmed animals





Animals farmed

Mink farms a continuing Covid risk to humans and wildlife, warn EU experts



Peter and Trine Brinkmann Nielsen put their flag to half-mast on November 5, 2020 at their mink farm in northern Denmark, as they will have to cull their 250,000 animals. /Claus Bjoern Larsen/Ritzau Scanpix/AFP

Mink cull



HUMANE SOCIETY INTERNATIONAL
 EUROPE

‘...gassing is a particularly cruel way to kill mink because they are semi-aquatic animals able to hold their breath for long periods. Recent Dutch video footage appears to show a mink that survived gassing being fished out of a container to be gassed again’

TOP STORIES

Coronavirus: Denmark to exhume millions of minks over pollution concerns

21.12.2020



In the United States, more than 12,000 of the country's three million farmed mink have died from COVID-19.

COVID-19 Effects on Livestock Production: A One Welfare Issue

Jeremy N. Marchant-Forde^{1*} and Laura A. Boyle²



- Few, large farms, large numbers of animals
- Enclosed, climate controlled, automated
- Few stockpersons
- Max. output/operate at full capacity
- Impact of any disruption felt immediately up and downstream

Short term effects of Covid-19 on supply chains

- Panic buying (eggs, cheese and milk)
- ↑ meals prepared at home
- ↓ meals eaten 'out'
- Food service industry vs supermarkets
- 12-15% ↓ in demand for dairy
- ↑ whole egg demand ↓ liquid egg



Covid-19 outbreaks in meat plants

- 40k cases, +420 plants, 40 states, 49 shutdowns



Bloomberg

Prognosis

German Meat Plant Ordered Shut After Coronavirus Outbreak

By Brian Parkin and Megan Durisin
June 17, 2020, 2:27 PM GMT+1 Updated on June 18, 2020, 7:44 PM GMT+1

- More than 700 workers at Toernies facility test positive
- Poor safety record cited for spate of cases at meat plants



The truck stands at the Toernies, Siroh meat plant near Garmisch, Germany, on June 17. Photograph: Lukas Schindler/Getty Images

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Shut down meat plants with major Covid outbreaks



Meat factories with major Covid outbreaks should be shut down, union says



- Line speed waivers
- ↑ 140 to 175 birds/min

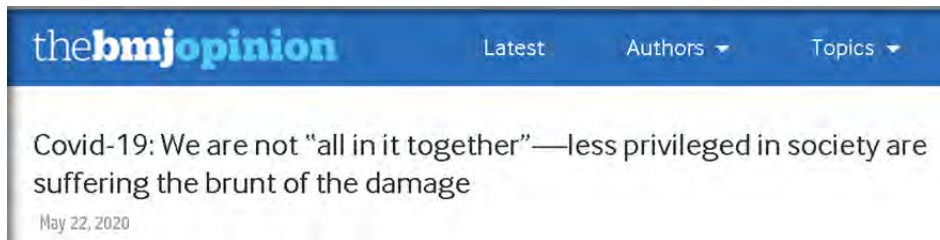
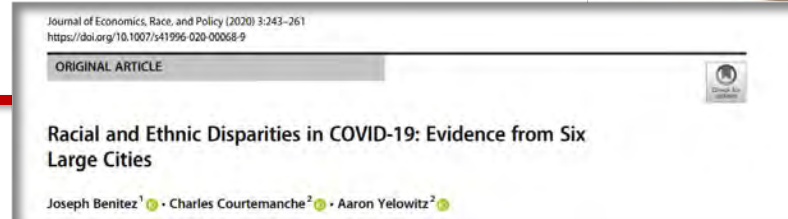


Covid-19 outbreaks in meat plants

- ↓ health/welfare of people sick with Covid-19

- Inequality issues

- Migrant and minority workers
- Language barriers
- Working conditions
- Food safety and zoonotic disease dictate hygiene practices
- Animal, equipment and assault related injuries
- Psychological stress/drug use
- Poorly paid, poor healthcare, lack of sick leave, high density and low quality housing



Covid-19 outbreaks in meat plants: Plant shutdowns



- Plant workers
 - Financial uncertainty, job losses
 - Increased workload/duties changed - ↑ injury and stress?
- Farmers
 - Financial losses
 - Psychological cost of depopulation
- Public health
 - Food safety
 - Carcass disposal (pathogens, odour, nuisance insects etc.)

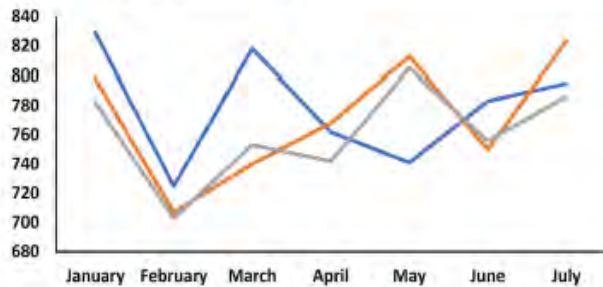




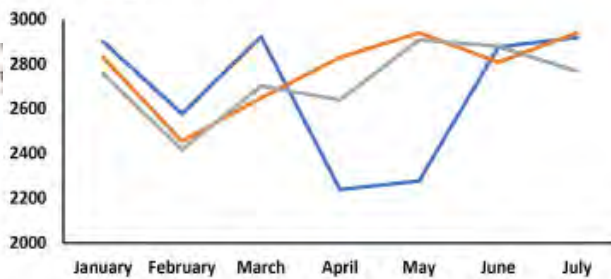
Loss in processing capacity



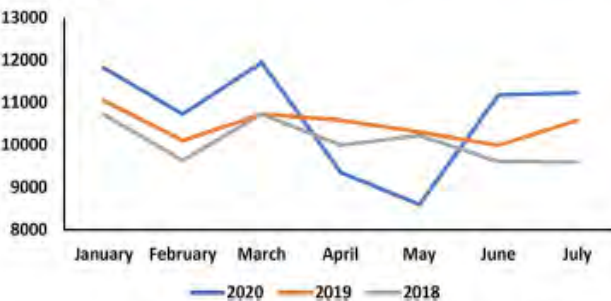
A U.S. broiler slaughter (1,000,000 head)



B U.S. cattle slaughter (1000 head)



C U.S. pig slaughter (1000 head)



— 2020 — 2019 — 2018

FIGURE 2 | Numbers of (A) broiler chickens, (B) cattle, and (C) pigs slaughtered per month in the United States between January and July over the last 3 years [Source: (28, 40)].

- April '20 pig slaughter capacity 55% of normal
- 250k pigs at slaughter weight/day
- Executive order to re-open
- May 19th capacity at 80% but still 100k pigs/day
- Poultry: ↑ line speeds recaptured some loss in capacity

Poultry welfare



- Line speed waivers – incomplete stunning?
- Fast growth rates - overcrowding in 17 days
- High stocking density
 - ↓ walking ability and leg health
 - ↑ fearfulness, FPD and mortality
 - ↑ heat production ↓ air and bedding quality
- ↓ eggs in incubator ↓ bird nos. 3wks
- Destroy eggs/kill chicks at hatching (2 mths)
- Welfare, ethical and societal concerns



Pig welfare

- Fast growth rates = rapid overcrowding
- High stocking density
 - ↓ activity and comfort behaviour, leg health
 - ↑ aggression/skin injuries, tail biting and susceptibility to disease
 - ↓ growth ↑ heat production ↓ air quality
- Mitigation strategies
 - Removal of growth promoters (U.S. ✓ pig welfare)
 - ‘Holding diets’ : ↓ energy diets ↑ fibre ↓ feed intake = ↑ hunger ↑ aggression
 - ↓ feed availability = ↑ hunger ↑ aggression
 - ↑ building temperature = ↑ heat stress
 - Stop breeding, induce abortions



Mass emergency killing of animals

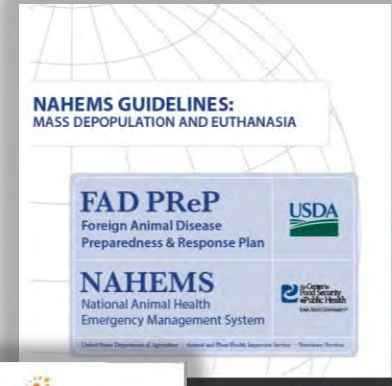
- Ideally euthanasia whereby animals killed without pain or distress
- Emergency killings should observe same standards as during slaughter
 - Minimal handling, immediate death, sedation or death while unconscious/stunned
- Difficult to achieve at scale
- Handling, stun/kill quality and confirmation of death prior to disposal



Mass emergency killing of animals



- As per September 2020
 - 600k pigs Iowa state alone
 - 10m birds





Mass emergency killing of animals

■ Killing methods

- (1) electrical; (2) mechanical; (3) gas mixtures; and (4) lethal injection (depends on size/age of pig)
- AVMA – Ventilation shutdown (VSD) + heat or CO_2 (VSD Plus)



■ Methods depends on production system (floor, cage, aviary)

- Water based foam, whole/partial house or containerised gassing, cervical dislocation, mechanically assisted cervical dislocation, decapitation and captive bolt gun



■ Method of choice

- Whole house gassing with water based foam methods

~~Oie~~

Mass emergency killing of animals

- Hazards to poultry (29) and pig (28) welfare
- Mostly related to stun/kill quality
- Lack of staff skills and training, and poor-designed and constructed facilities
- Poultry
 - Insufficient time of exposure
 - Timing of ventilation shut-down (VSD)
- Negative impact on animal welfare
 - Pain, fear, impeded movement, respiratory distress



Animal transport

- ↑ transportation time = ↑ transport stress
 - Movement to alternative slaughter plants
 - Restrictions on movement between countries



The West Australian

THE ONLY NEWSFEED YOU NEED: Four easy ways to get all the latest news from us

Coronavirus (COVID-19) | Perth | WA News | Trade

Coronavirus crisis: Sick Al Kuwait crew given all clear as WA's active COVID cases tally is reduced to two

AAP
Mon, 15 June 2020 12:52PM




All crew from a livestock ship that has been stranded at a West Australian port for more than three weeks have been cleared of COVID-19. Credit: Paul Kane/Getty Images

frontiers
in Veterinary Science

PERSPECTIVE
published: 29 January 2021
doi: 10.3389/fvets.2020.621843

Impact of the COVID-19 Pandemic on the Welfare of Animals in Australia

Jacqueline Baptista¹, Dominique Blache^{2,3}, Keren Cox-Witton⁴, Nicola Craddock⁵, Toni Datzel⁶, Nicolas de Graaff⁶, Jill Fernandes^{3,7}, Ronda Green⁸, Helen Jenkins⁹, Sarah Kahn¹⁰, Deborah Kelly⁶, Mariko Lauber¹¹, Shane K. Maloney^{3,12}, Bridget Peachey¹³, Ian Rodger¹⁴, Jeremy Skuse¹⁵, Alan J. Tilbrook^{3,7*}, Frederick Rohan Walker^{3,16}, Kelly Wall⁹ and Sarah Zito¹⁷

 **Australian Government**
Department of Agriculture,
Water and the Environment

PUBLIC STATEMENT OF REASONS

On 8 June 2020, the Department of Agriculture, Water and the Environment (**Department**) received an application for exemption submitted by Rural Export & Trading (WA) Pty Ltd (**RETWA**), pursuant to s 11 of the *Australian Meat and Live-stock Industry (Prohibition of Export of Sheep by Sea to Middle East—Northern Summer) Order 2020 (Cth)* (**Northern Summer Order**).

I am a delegate of the Secretary for the purpose of s 12 of the Northern Summer Order.



Contents lists available at ScienceDirect

 **The Veterinary Journal**

journal homepage: www.elsevier.com/locate/tvj

Review

Heat stress: A major contributor to poor animal welfare associated with long-haul live export voyages

Malcolm P. Caulfield^{1,2}, Heather Cambridge³, Susan F. Foster³, Paul D. McGreevy⁴



Cull sow issues


- BE and NL: 60K sows/week
- Ireland: +50% of cull sows
- UK: Brexit + Covid-19
- Backlog of cull sows on farms
- Poor welfare of cull sows




FARMERS
WEEKLY

- A cull sow can normally buy a gilt and sometimes leave some change left over. It is currently taking three sows to buy one gilt and prices are at about 40p/kg.



 ORIGINAL RESEARCH
published: 18 February 2019
doi: 10.3389/fvets.2019.00009



Transportation of Cull Sows—Deterioration of Clinical Condition From Departure and Until Arrival at the Slaughter Plant

Karen Thodberg*, Katrine Kop Fogsgaard and Mette S. Herskin

Other threats to the welfare of livestock

- ↓ profit margins
- Disruptions in importing feed, vet. medicine
- Limitations on animal/human (vet) movement
- Poor record keeping
- Vet resources switched to Covid-19 (epidemiology, diagnostics etc.)
- Postponement of disease eradication schemes
- Others





Environmental welfare: Pollution risks



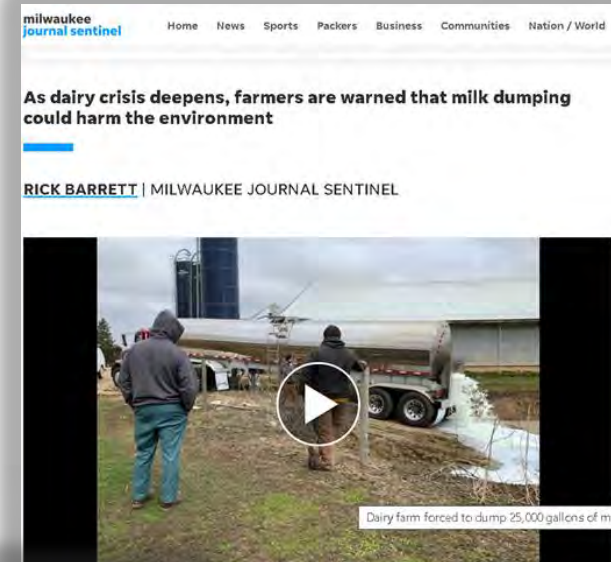
- Carcass disposal poses a pollution risk
 - Bodily fluids, chemical and biological leachate components
 - Hazardous gases (NH_3 , H_2S , CH_4)
 - Air, surface and ground water contamination
- Disposal method
 - Un/lined burial and composting
 - Incineration and rendering



Environmental welfare: other considerations



- New 'stream' of pollution
- 'Run-off' from dead chicken compost (high in P)
- Risks to wildlife (#animalwelfare)
- Milk - high biochemical O₂ demand
- Involuntary culling ↑ GHG emissions



Water Air Soil Pollut (2015) 226: 407
DOI 10.1007/s11270-015-2669-y



Industrial Swine and Poultry Production Causes Chronic Nutrient and Fecal Microbial Stream Pollution

Michael A. Mallin · Matthew R. McIver ·
Anna R. Robuck · Amanda Kahn Dickens



J. Dairy Sci. 94:3662–3678
doi:10.3168/jds.2010-4023
© American Dairy Science Association®, 2011.

The effect of improving cow productivity, fertility, and longevity on the global warming potential of dairy systems

M. J. Bell,*¹ E. Wall,* G. Russell,† G. Simm,* and A. W. Stott*

*Scottish Agricultural College (SAC), West Mains Road, Edinburgh, EH9 3JG, United Kingdom

†School of GeoSciences, University of Edinburgh, West Mains Road, Edinburgh, EH9 3JN, United Kingdom



Short-term solutions

- Production

- Alternative methods of mass euthanasia/disposal of animals
- Mobile incineration units

- Processing

- ↑ capacity: 5.4 to 7 days = 30% ↑
- Local/mobile abattoirs



COVID-19 Effects on Livestock Production: A One Welfare Issue

Jeremy N. Marchant-Forde^{1*} and Laura A. Boyle²

Journal of Rural Studies 32 (2017) 93–102

Contents lists available at SciVerse ScienceDirect

 Journal of Rural Studies

ELSEVIER journal homepage: www.elsevier.com/locate/jrurstud

Food safety at the small scale: The case of meat inspection regulations in British Columbia's rural and remote communities

Christiana Miewald^{a,*}, Aleck Ostry^b, Sally Hodgson^b



Applied Animal Behaviour Science 149 (2013) 21–29

Contents lists available at ScienceDirect

 Applied Animal Behaviour Science

ELSEVIER journal homepage: www.elsevier.com/locate/applanim

Mobile abattoir versus conventional slaughterhouse—Impact on stress parameters and meat quality characteristics in Norwegian lambs

Marit Skog Eriksen^{a,*}, Rune Rødboten^b, Ann Margaret Grøndahl^c, Mari Friestad^b, Inger Lise Andersen^c, Cecilie M. Mejdell^c



Short-term solutions

- Retail
 - ‘Slow food’, ‘local produce’
 - Direct to consumer retail models
- Consumption
 - Initial changes #Onewelfare benefits
 - ↑ basic ingredients/home prepared meals
 - ↑ plant based meat alternatives (???)
 - Shift from high meat to diet rich in unprocessed plant based foods



COVID-19 Effects on Livestock Production: A One Welfare Issue

Jeremy N. Marchant-Forde^{1*} and Laura A. Boyle²



Long-term solutions

- Policy change
- Sustainable intensification
- Moderate demand for animal products
- ↓ food waste



Contents lists available at SciVerse ScienceDirect

Biological Conservation

ELSEVIER journal homepage: www.elsevier.com/locate/biocon

Special Issue Article: Advancing Environmental Conservation: Essays in Honor Of Navjot Sodhi

Global food security, biodiversity conservation and the future of agricultural intensification

Teja Tscharntke^{a,*}, Yann Clough^a, Thomas C. Wanger^{b,c}, Louise Jackson^d, Iris Metzger^e, John Vandermeer^f, Anthony Whitbread^g

International Journal of Agricultural Sustainability

Taylor & Francis Group

ISSN: 1473-5903 (Print) 1747-762X (Online) Journal homepage: <http://www.tandfonline.com/loi/taags20>

Addressing the Faustian bargain of the modern food system: connecting sustainable agriculture with sustainable consumption

Colin Sage

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This article is more than **9 months old**

'Exploitative conditions': Germany to reform meat industry after spate of Covid-19 cases

Ban on use of subcontractors and fines of €30,000 for slaughterhouses breaching new labour regulations a 'historic moment', say campaigners

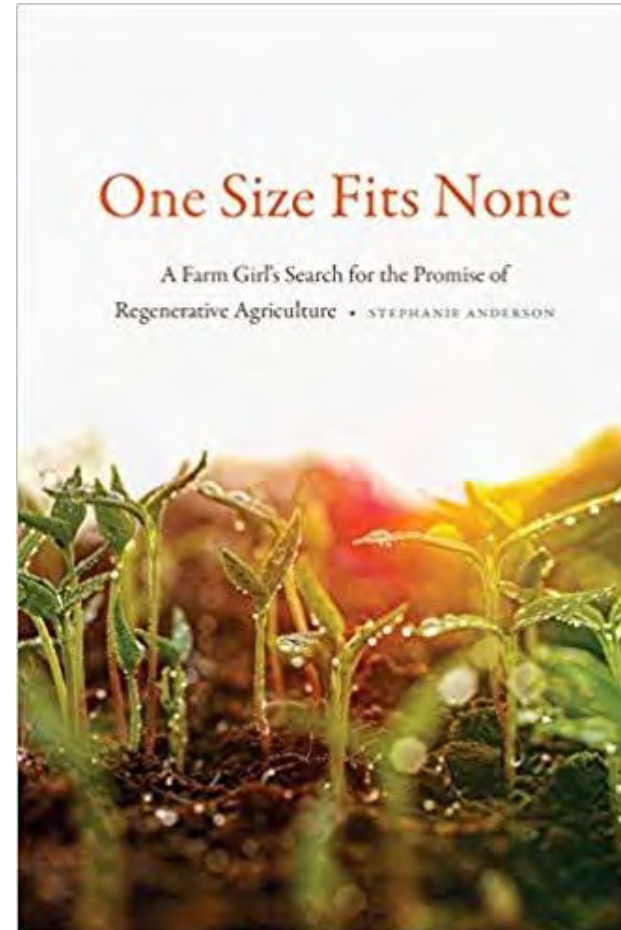
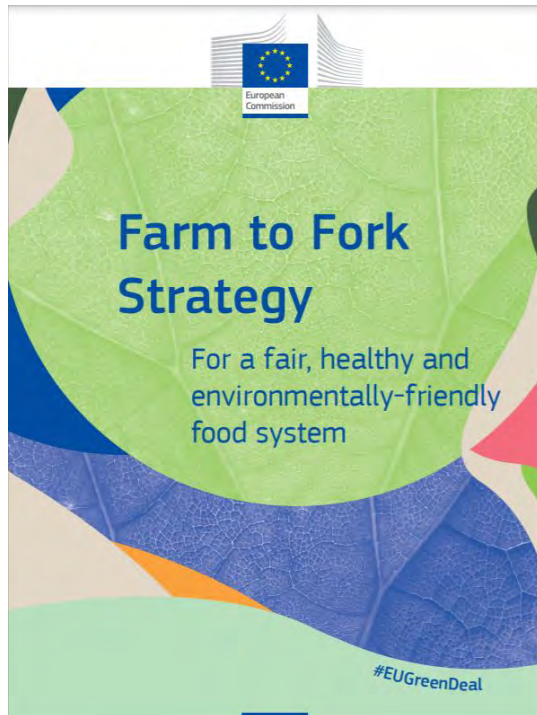
Coronavirus - latest updates

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North Rhine-Westphalia, where more than 270 Westfleisch workers tested positive. Photograph: EPA

Alternative production systems



One size fits none



PROCEEDINGS
OF
THE ROYAL SOCIETY

B

Sustainable, efficient livestock production with high biodiversity and good welfare for animals

D. M. Broom¹, F. A. Galindo^{1,2} and E. Murgueitio³

rspb.royalsocietypublishing.org

productive than pasture alone. When compared with widely used livestock production systems, silvopastoral systems can provide efficient feed conversion, higher biodiversity, enhanced connectivity between habitat patches and better animal welfare, so they can replace existing systems in many parts of the world and should be further developed.

Forbes

Feb 20, 2020, 02:00am EST | 4,447 views

Kipster's Golden Egg: How To Build A Profitable And Scalable Sustainable Business



Jeroen Kraaijenbrink Contributor @

Leadership

I help companies do strategy



#OneWelfare solutions



Central role of Animal Welfare

Research in Human Ecology

The Connection to Other Animals and Caring for Nature

Joanne Vining
 Human Nature Research Laboratory
 Department of Natural Resources and Environmental Sciences
 University of Illinois at Urbana/Champaign
 Urbana, IL 61801
 USA¹

© 2019 Universities Federation for Animal Welfare
 The Old School, Brewhouse Hill, Wheathampstead,
 Hertfordshire AL4 8AN, UK
www.ufaw.org.uk

Animal Welfare 2019, 28: 137-141
 ISSN 0962-7286
 doi: 10.7120/09627286.28.2.137

Animal welfare as preventative medicine

MS Dawkins

Animal (2017), 11:2, pp 274–284 © The Animal Consortium 2016
 doi:10.1017/S1751731116001440



Review: current available strategies to mitigate greenhouse gas emissions in livestock systems: an animal welfare perspective

P. Llonch^{1†*}, M. J. Haskell¹, R. J. Dewhurst² and S. P.







Review

Towards Farm Animal Welfare and Sustainability

Henry Buller^{1,*}, Harry Blokhuis², Per Jensen³ and Linda Keeling²



Conclusion

- Covid-19 raised a myriad of #OneWelfare concerns
- Highlighted fragility of food systems
- Unique opportunity for radical change
- To build resilience and ensure food security in the face of future challenges



#OneWelfare driven transformation of livestock production will ensure a safer, fairer and healthier environment for all

Thank you!

ONE WELFARE OIC PRESENTS

III

ONE WELFARE WORLD CONFERENCE



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