Livestock production, health & welfare: menage a trois of international opportunity

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Poverty increase in developing countries – Global Food Crisis
Animal welfare is a trade barrier in developed countries

Hunger and malnutrition

Number of hungry people in millions

Developing world

Developing world without China

Data source: FAO 2006
Study of disease mechanisms: menage a trois of HPE understanding

Host

Pathogen

Environment

Pathogenesis

Finding the Path sweet spot
Livestock production, health & welfare: menage a trois of international opportunity

Health

Research Opportunities

Production

Welfare

Finding the Research sweet spot
Livestock production, health & welfare: menage a trois of funding sources

RDC’s remain imp. source of funds to manage issues: welfare
Aid budget to 0.05% GDP, double to $8b by 2015, ACIAR 1.6%
Enormous potential to assist in building capacity; training
Peter White BVSc MLA
Congenital chondrodystrophy: nutritional, drought
Jenny-Ann Toribio

Jess King BAVBiosc IA-CRC (CEO award) Neospora caninum lifecycle; dingo
Jan Slapeta

Sabrina Lomax BAVBiosc ARC-LP
Pain management for mulesing, castration; topical anaesthesia
Peter Wynn (CSU)
The association between congenital chondrodystrophy of unknown origin (CCUO) in beef cattle and drought in south-eastern Australia

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ABSTRACT

Reports of congenital chondrodystrophy of unknown origin (CCUO) have been anecdotally associated with periods of drought during the gestation period of affected beef calves. Reported sporadically in the past, the incidence of CCUO has increased in south-eastern Australia and has been reported every year between 2002 and 2007. A maternal nutritional deficiency arising from poor quality pastures and supplements has been suggested as contributing to the disorder. With an increase in drought occurrence predicted by climate change models, it is possible that the incidence will increase into the future.

Retrospective data collected during a case control study was used to determine if the occurrence of cases of CCUO was associated with rainfall deficiency during gestation. A total of 799 cases occurring on 46 farms in south-eastern Australia were identified and a time series of cases was created. The association of both average monthly and three-month average rainfall with cases of CCUO revealed a significant negative correlation ($r = -0.29$ and $r = -0.37$ respectively, $P < 0.05$) five months prior to the birth of CCUO calves on the farms studied. Logistic regression analysis showed a 3.3 (CI 1.8; 5.8, $P < 0.001$) times increased risk of CCUO calves when the three-month average rainfall was in the lowest decile five months prior to the birth of calves. This information may be used to alert farmers as to when high quality supplemental feed may be provided to improve maternal nutrition and reduce the number of CCUO calves born.
Australian dingoes are definitive hosts of Neospora caninum

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A B S T R A C T

To provide objective data on the potential role of dingoes (Canis lupus dingo) in the life cycle of Neospora caninum in Australia, the production of N. caninum oocysts by experimentally infected canids was investigated. Three dingo pups raised in captivity and three domestic dogs were fed tissue from calves infected with an Australian isolate of N. caninum, Nc-Nowra. Oocysts of N. caninum, confirmed by species-specific PCR, were shed in low numbers by one dingo pup at 12–14 days p.i. The remaining animals did not shed oocysts. Furthermore, the blood from two out of three dingoes tested positive for DNA of N. caninum using PCR tests at 14 and 28 days p.i. Oocyst shedding from the intestinal tract of a dingo demonstrates that dingoes are definitive hosts of N. caninum and horizontal transmission of N. caninum from dingoes to farm animals and wildlife may occur in Australia.

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Impact of topical anaesthesia on pain alleviation and wound healing in lambs after mulesing

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Objective  To investigate the impact of using the topical anaesthetic preparation Tri-Solfen® on pain alleviation and wound healing in lambs undergoing mulesing.

Design  Three separate trials, placebo controlled and/or randomised, were carried out over a 5 month period on three mobs of between 60 and 263 merino lambs undergoing routine mulesing.

Procedure  Wound pain was assessed using 10 and 75 g calibrated Von-Frey monofilaments to determine sensitivity to light touch and pain stimulation over a 4 to 8 h period. Pain-related behaviour was documented by trained, blinded observers using a numerical rating scale. Wound healing rates were determined using scaled digital photography and image analysis software to calculate contraction in wound surface area 2 and 4 weeks after mulesing.

Results  There was rapid (3 min) and prolonged (up to 8 h) wound analgesia as shown by pain response scores (P ≤ 0.01), with absent or significantly diminished primary and secondary hyperalgesia (P ≤ 0.01) and significant reduction in pain-related behaviour (P < 0.001) in treated versus untreated lambs. In addition there was improved wound healing in the treated lambs (P ≤ 0.05).

Conclusion  Tri-Solfen® effects rapid and prolonged wound analgesia, reduction in pain-related behaviour and improved wound healing in lambs undergoing routine mulesing, providing effective alleviation of pain associated with routine mulesing in sheep.

Key words: lambs, mulesing, analgesia, welfare

Recently, Tri-Solfen® (Bayer Animal Health, Gordon, NSW) a spray-on topical anaesthetic and anti-septic gel became commercially available for use on farms in Australia. The product was specifically

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c Department of Veterinary Studies, School of Veterinary Sciences, University of Sydney, Australia (P Windsor).
2007 & 08: BAVB Hons-PhD’s: Lomax, Espinoza: Neo/Pain; AWET

2009: BVSc Hons J Gollan: OJD vaccine efficacy risk factors NSW/Vic; AWET
BVSc RPP interns K Mills & P McClenaughn: Footrot eradication (AVJ)
BAVB Hons S Bishop: Neospora in sheep (Vet Parasitol)

2010: BVSc Hons A Masters: Kangaroo Isl. OJD vaccination efficacy; AWET
BAVB Hons V Scott: pre-surgical & topical analgesia for lambs; AWET
BAVB Hons R Barnett: CLA control (with Dr Russell Bush)

2011: TBA
Short communication

The first report of ovine cerebral neosporosis and evaluation of Neospora caninum prevalence in sheep in New South Wales

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\textbf{Abstract}

Presence of \textit{Neospora caninum} DNA was detected in the brain and spinal cord of an adult Merino sheep suspected of dying with acute non-suppurative meningoencephalitis and mild to moderate non-suppurative myelitis. The most severe neurological lesions were found in the midbrain at the rostral colliculi with moderate to severe multifocal vasculitis and gliosis. As this was the first known occurrence of cerebral disease in sheep in Australia caused by \textit{N. caninum}, we surveyed sera from five sheep properties in New South Wales (NSW) to obtain information on the likely prevalence of \textit{N. caninum} infection in NSW sheep flocks. Serology using a commercial indirect enzyme-linked immunosorbent assay (ELISA) revealed no \textit{N. caninum} antibody-positive sheep \textit{(n = 184)}. However an observed prevalence for \textit{N. caninum} antibodies using a commercially available competitive ELISA was 2.2\% \textit{(5/232)}. We conclude that although the diagnosis of fatal ovine cerebral neosporosis is of importance to our surveillance program for transmissible spongiform encephalopathy (TSE) exclusion, sheep in NSW are not commonly infected with \textit{N. caninum} and this species likely plays only a minor role in the life cycle of this parasite in Australia.

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Continuing PhD students

Crystal Espinoza BAVBiosc ARC-LP
Pain management for dehorning, pig husbandry; topical anaesthesia

Greg Cronin

Luzia Rast BVSc MVPHM ACIAR
Parasites of economic sig. in Lao PDR;
Toxocara in calves & Fasciola in buffalo/cattle
Peter Rolfe (Novartis)

John Stratton BVSc AB-CRC & ACIAR
Strengthening Vet Services in Cambodia; VVW’s & FMD
Mike Nunn (Biosec Aus)
Limiting the Impacts of Foot and Mouth Disease in Large Ruminants in Northern Lao People’s Democratic Republic by Vaccination: A Case Study

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Keywords:
foot and mouth disease; cattle; buffalo; vaccination; financial impact; Lao People’s Democratic Republic

Summary

Foot and mouth disease (FMD) is the most important global transboundary livestock disease and is endemic in Lao People’s Democratic Republic (Lao PDR) with outbreaks occurring regularly. Lao PDR shares borders with five countries and as a major thoroughfare for transboundary livestock movement, is vulnerable to the social and economic impacts of FMD. The FMD outbreak occurred in January 2009 in the Pek District, located in the north-eastern Lao PDR province of Xieng Khuang and involved all 111 villages in that district. In March 2009, we conducted a case study on the impacts of FMD in four villages in Pek District. In two villages cattle and buffalo were vaccinated for FMD
2008: BVSc RPP intern L Geiger: Fasciola in Cambodia
BAVB Hons L York: farmer knowledge to health/production in Laos

2009: 2 BVSc Hons S Lee/ V Ambler: Toxocara vitulorum & Fasciola gigantica
BAVB Hons S Nampanya: biosecurity in Laos (AB CRC Hons schol.)

2010: BVSc Hons D Wills: FMD vaccination in Cambodia Laos: OIE
BAVB Hons T McDonald: weigh bands for Cambodia & Laos
BVSc RPP intern R Bailey: abattoir surveillance in Laos

2011: 1 or 2 BVSc Hons & 5 BVSc RPP interns nominated for Laos/Cambodia
Aim: find best practice methods to:

› Improve the smallholder farmer knowledge of cattle and buffalo disease control and husbandry

› Increase productivity and income from large ruminants: subsistence to intensive production system
Forages: fix dry season feed gap & enable fattening for sale, draft & improved reproduction
Large volumes required: 15% body weight.
Silage wet season feed 4 dry: 15-18kg bag/day
Vaccination:
- costs of FMD in XK in ’09
- but ’10 outbreak shows failure of biosecurity & need for

Biosecurity program:
- movement controls
- quarantine of introductions
- disinfection.....traders
- surveillance & reporting
- public awareness....
- risk assessment: no animals ex current outbreaks
Low calf survival: **Toxocara**
- 77% villages +ve
- 23% calves +ve
- only 8% treated, 17% ineffective
- need survey; why so low?

Low cow BCS: **Fasciola**
- 49% in LP abattoir survey
- need prev. study
Manage: grazing difficult
- cut forage above 10cm
Treat - end of dry: snail
- Triclabendazole best
- others useful?
- treatment trials
Animal identification, record:

- **Matings**: IC interval 12m
- **Calvings**: accurate calving rate

  Why few Buffalo calves?:
  - low fertility, slaughter pregnant
  - low calf survival, other?

- **Castration** of bull calves:
  - Burdizzo, select best bulls, ?buy in

- **Cow–Bull separation**:
  - avoid inbreeding; sire-daughter
  - best bulls mate with cows
- Cow and bull breeding soundness

- **Condition scoring: 1–5**
  - cull poor performers, note:
  - lactating cows have low CS in dry,
  - so retain & feed to maintain CS > 2.5

- **Pregnancy testing:**
  - cull empties; infertility
  - empty cow has high CS
  - sell or keep?

- **Restricted joining:**
  - time calving to feed availability:
  - wet season: June–August
Empowering farmers
- need knowledge of market needs

Target markets eg
- **fats**: fat animals for export or local slaughter
- **stores**: for breeding or fattening; local trade

Values based: on **CS**, general appearance, ‘meat yield’
- need better understanding live weight dressing %

Group selling by farmers - meeting the market
How do we help farmers implement these interventions?
Improving Production System

Efficiency

Growth

Nutrition

Health

Reproduction

Marketing

Genetics

Social & Financial Returns

Alleviating rural poverty through large ruminant production

Health & Welfare

Health

Growth

Nutrition

Reproduction

Genetics

Marketing
Welfare in SE Asia: when?

Interventions can greatly increase returns
Livestock production, health & welfare: menage a trois of additional funding

Large Development Project: $20m LDP
Research Project
Train the trainers
ALA Fellowship

An ideal model for research in international development?: Leverage project to build capacity through research & training
Alleviating rural poverty through large ruminant production