NSW Sheep Health Monitoring Program
2006-2012

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EHGC Sheep Field Day 13 July 2012
Why Abattoir Monitoring?

- Objective measurement of disease conditions at slaughter
- Traceability based on NLIS
- Feedback to producers, processors, gov’t, industry
- Spatial & time line analyses
- Benchmarking
- Economic analysis
- Policy development
- Focus RD&E priorities
Why Abattoir Monitoring?

- Cost effective
- Evaluate change
- Aim
  - Increased on-farm productivity
  - Protect export markets
  - Decrease processing losses
  - Zoonoses
  - Animal welfare
- Consistent with MLA, AWI & I&I Strategic Plans
NSW Pilot Sheep Health Monitoring Program

- Commenced January 2006 implemented in NSW as an adjunct to the OJD program
- July 2007 extended nationally funded by WoolProducers and Sheep Meats Council
- Managed nationally by Animal Health Australia
- Program extended beyond June 2012
- Monitors major export abattoirs in each state
- Coordinated nationally through EH Graham Centre, Wagga Wagga (alliance of I&I NSW and CSU)
INSPECTION & TRACEABILITY

- Trained AQIS meat inspectors
- Adult sheep – 2 years or older
  - Lambs (since 2012)
- Direct consignments priority
- Target 90% of sheep inspected
- NVD PIC, NVD SerialNo, Eartag PIC(s)
- Owner, Lot No, Killdate, Locality, No. Killed, No. Inspected, No. or % of Lesions
DATA RECORDING

- “Other Conditions” Inspection sheets & abattoir kill sheets faxed daily to Wagga
- Entered into database
- Linked to NSW PIC database
- Adds in property details, LHPA, LGA (Local Government Area –formerly RLPB)
- Standardise data
- Generate reports - mail merge address
DATA RECORDING

- Large dataset provides detailed outcomes
- >15,000 direct consignments in database
- >3,700,000 sheep individually inspected
- Large proportion of population sampled
- 6.5 years data – 2006 – 2012
- Geographic coverage all NSW sheep areas
- Limitation – no data for lambs prior to 2012
NLIS is the Future
NLIS is the Future

- Progressive implementation of NLIS in abattoir monitoring since 1999
- >99.5% of direct consignments monitored across Australia now recorded against PIC
- Spatial & Time-Line Analysis – mapping
Other Conditions Monitoring

- Wide range of “Other Conditions” Include:
  - Parasitic - liver fluke, sheep measles, “knotty gut” (Oesophagostomum), lungworm, bladder worm (C tenuicollis), hydatids (zoonosis)
  - Bacterial - CLA – caseous lymphadenitis, pneumonia, arthritis, fever/septicaemia
  - Protozoal - sarcocysts
  - Animal Welfare – dog bites, emaciation, grass seeds, OJD & other vaccine abscesses, bruising
  - Toxicology/Plant Poisoning – liver cirrhosis, jaundice, melanosis, broken ribs
  - Cancer
NSW Sheep Health Monitoring Website

- Maps
- Prevalence data
- Fact sheets & information
Inspecting Viscera
– Photo courtesy of Ian Links
Inspecting Viscera
– Photo courtesy of Ian Links
Percent of adult sheep affected - major conditions

- CLA
- Bladder Worm
- Liver fluke
- Pleurisy/ Pneumonia
- SheepMeasles
Percent of adult lines affected - minor conditions

- OJD Vaccine Lesions
- Dog bites
- GrassSeedLesions
- Hydatids
- Lungworm
- PoorVaxTech
- Sarcocytosis

EH GRAHAM CENTRE for Agricultural Innovation
Percent of adult sheep affected - minor conditions

- OJD Vaccine Lesions
- Cancer
- Dog bites
- KnotGut/ NodWorm
- GrassSeedLesions
- Hydatids
- Lungworm
- PoorVaxTech
- Sarcocytosis
Other Conditions – NSW 2006
3608 direct consignments, 964,245 animals
Liver Fluke
Production losses, control costs, processor losses
Chronic Liver Fluke
– courtesy Wayne Gilbert
Moderate Liver Fluke

Courtesy of Wayne Gilbert
Mild Liver Fluke – Lambs
– Photo courtesy of Ian Links / Mark Lyons
Chronic Fluke – courtesy Wayne Gilbert
Chronic Liver Fluke
– courtesy Wayne Gilbert
Chronic Liver Fluke
– courtesy Wayne Gilbert
Moderate Liver Fluke with Sclerosis (Scarring) - Courtesy Wayne Gilbert
Liver Sclerosis (Scarring)
– courtesy Wayne Gilbert
Liver Fluke – State Prevalence
National Sheep Health Monitoring Project -2007-08

Liver fluke 2007-08

Animals
Lines
CLA /Cheesy Gland
Zero tolerance export markets
CLA in Liver – Courtesy Wayne Gilbert
Cheesy Gland – CLA
National Sheep Health Monitoring Project -2007-08

CLA (Cheesy Gland) 2007-08

Animals
Lines

NSW QLD SA TAS VIC WA Total
National Sheep Health Monitoring Project

2009

Caseous lymphadenitis

Overall percentage of (inspected) animals infected

Average percentage of (inspected) animals infected per line

Percentage of inspected lines with at least one infected animal

NSW  Qld  SA  Tas  Vic  WA

Percent
Hydatids - *Echinococcus granulosis* 
Zoonosis
Hydatids Liver – courtesy Gary Tonkin
Hydatids Lung – Courtesy Gary Tonkin
Hydatids Liver – courtesy Wayne Gilbert
Hydatids – state prevalence

National Sheep Health Monitoring Project -2007-08

Hydatids 2007-08

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<tr>
<td>WA</td>
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<tr>
<td>Total</td>
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Sheep Measles – *Taenia ovis*

Tapeworm cysts in muscle - Zero tolerance for export markets

NSW Sheep Health Monitoring Program - 3618 Direct Abattoir Consignments Jan-Dec 2006
Sheep Measles - Ovis of 1506 (27.9%) Positive Lines with 5% or More Affected Sheep
Prepared by Ian Link for NSW DPI 01Jun2007
Sheep Measles – *C. ovis* tapeworm cysts

– Photo courtesy of Ian Links / Mark Lyons
Sheep Measles – *C. ovis* - Lamb Hearts & Diaphragm
– Photo courtesy of Ian Links / Mark Lyons
Sheep measles – *C. ovis* - Lamb Diaphragm – Photo
courtesy of Ian Links / Mark Lyons
Sheep Measles – *C. ovis* Heart & Diaphragm

– Photo courtesy of Ian Links / Mark Lyons
Sheep Measles – *C. ovis* - State Prevalence

National Sheep Health Monitoring Program 2007-08

![Bar chart showing the prevalence of Sheep Measles (C. ovis) in different states and the total across Australia for the years 2007-2008.](chart.png)
2009

Sheep measles

Overall percentage of (inspected) animals infected

Percent

Average percentage of (inspected) animals infected per line

Percentage of inspected lines with at least one infected animal

NSW  Qld  SA  Tas  Vic  WA

EH GRAHAM CENTRE for Agricultural Innovation
Nodule Worm / Knotty Gut – 2006
(1.4% of lines, 0.2% of animals)
Makes intestines useless for sausage casings

NSW Sheep Health Monitoring Program - 3903 Direct Abattoir Consignments Jan-Dec 2006
Nodule Worm / Knotty Gut / Pimply Gut (Oesophagostomum columbianum) Origin of 51 (1.4%) Positive Lines with 1 or More Affected Sheep
Prepared by Ian Links for NSW DPI 01Jun 2007
Knotty Gut – Nodule Worm

*Oesophagostomum columbianum*

– Photo courtesy of Wayne Gilbert
Knotty Gut – Nodule Worm

Oesophagostomum columbianum - Summer Rainfall Areas

– Photo courtesy of Wayne Gilbert
OJD Vaccine Abscesses  Rare due to extension effort but remains a concern to processors/animal welfare
Cysticercus tenuicollis – Bladder Worm
(59.6% of lines, 13.6% of animals)
Bladder worm in liver – liver condemns
Bladder Worm (*Cyst. tenuicollis*)

Courtesy Ian Links / Wayne Gilbert
Bladder Worm Cyst

Courtesy of Chris Cocker
Calcified *C. tenuicollis* - “Bladder Worm” Tapeworm cysts in liver – Courtesy Wayne Gilbert
Calcified Bladder Worm Cysts In Liver & Loose Fluid-Filled Cyst - *C. tenuicollis*

- Courtesy of Ian Links / Mark Lyons
SARCOCYST – 2006
(2.1% of lines, 0.2% of animals)
Protozoal cysts in muscle - cats
Sarcocysts in Oesophagus – Courtesy Wayne Gilbert
Pleurisy-Pneumonia
Other Conditions

- Inspection sheets provided to abattoir management daily (notify major non-compliers)
- Mailout direct to producers – NLIS dependent
- Spreadsheet of individual consignments to LHPAs
- Communications & awareness program
Grass Seeds (likely Stipa sp) - Lamb Flanks

Courtesy Ian Links / Mark Lyons
Grass Seeds – Likely *Stipa sp* – Lamb flanks

Courtesy Ian Links / Mark Lyons
Lungworm Nodules

*Muellerius capillaris* – Courtesy Wayne Gilbert
Abdominal Wall & Diaphragm – Likely Selenium Injection  Courtesy Geoff Keipert
Abdominal Wall & Diaphragm – Likely Selenium Injection Courtesy Geoff Keipert
Black Livers in Sheep – courtesy Wayne Gilbert
Black Livers Sheep

Courtesy Peter Dundon MLA
Other Conditions - developments

- GHD National Review - Animal Health Australia - Report quantifying the benefits and costs of E-Surveillance - Sheep and goats - March 2009

- Touch screen trial in abattoirs planned

- Extending mail-out to individual producers in all LHPAs – June 2012

- Economic analysis – Tom Nordblom
Other Conditions Reports

- 2 page Overview
- 1 page conditions observed for that consignment
- 1 page – background summary of cause & relevance of the various conditions
Sheep Measles & Hydatids Survey

- Sheep Measles survey – EHGC (NSW DPI in conjunction with Charles Sturt University School of Agriculture & Veterinary Science)

- David Jenkins, Jan Lievaart, Nick Sangster, Tom Nordblom, Ian Links

- Funding approved for 3 years by MLA March 2012

- Contact producers with detections in their sheep

- Identify risk factors and better control strategies – house dogs, farm dogs, wild dogs, dingoes, foxes

- Preliminary survey of Risk Factors in Tablelands LHPA – questionnaire and sampling dogs in 2009-10 – proof of concept
Sheep Measles & Hydatids

- Similar lifecycle (canine tapeworm – herbivore cysts) – 3 tapeworms

- *Cysticerus ovis* (Sheep Measles) – mainly domestic dogs rare in dingoes or wild dogs, foxes apparently not involved.

- *Echinococcus* (*Hydatids*)

- *Cysticercus tenuicollis* (Bladder Worm in liver)
Acknowledgements

- NSW DPI, Animal Health Australia, Sheepmeat Council of Australia & WoolProducers Australia for funding the National Sheep Health Monitoring Project
- Management of NSW abattoirs (Wallangarra, Cootamundra, Gundagai, Cowra, Dubbo, Goulburn Junee, Deniliquin, Mudgee, Young, West Wyalong) & interstate abattoirs inspecting NSW sheep
- District Veterinarians with Livestock Health & Pest Authorities
- Individual sheep producers who benefitted from the feedback
- The highly skilled & committed meat inspectors incl. AQIS staff
- Wayne Gilbert & Mark Lyons who initiated and promoted the concept/feasibility of monitoring for Endemic Disease and “Other Conditions”