Innovation in Mastitis Treatment

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Biography

• Started working with dairy cows at age of 11
  – First independent calving
  – First cow surgery at 16

• Work on mastitis 17 years
  – Mastitis treatment products development since 2004
    • Bomac, Bayer, Elanco, Pfizer, Homeopathic farm supplies
  – Organic vs. conventional farming
  – Causes of mastitis
  – Economics of mastitis
  – Mastitis management
Biography cont’

• Herd health consultancy
  – NZ (2006-2013)

• Mastitis consultancy
  – NZ (2006-2013)
  – USA (2007)
  – Argentina (2007-2012)

• Farmer and veterinarians discussion groups and workshops (1997-2013)
What is new in the world

- Diagnosis
- Automation
- Prevention
- Vaccine development
- Treatment
Why does mastitis treatment fail?

• Multifactorial
  – Management of mastitis cows
  – Drugs’ factors
  – Udder factors
  – Cow factors
  – Herd factors
Management factors

• Inaccurate diagnosis
• Delayed initial treatment
• Improper dose or treatment regime
• Improper route of administration
• Depth of insertion of the infusion cannula
• Duration of treatment
• Inadequate supportive treatment
• Failure to treat according to best practice
Prevention management factors

- Accurate diagnosis
  - Differentiation of sub-clinical and clinical mastitis
  - Differentiation of teat canal infection and clinical mastitis
- Prompt and appropriate treatment
- Concepts of super-infection and re-infection
- Assessment of treatment outcomes
- Treat with full dose
Prevention management factors cont’

• Proper administration of drugs
  – Route of administration, hygiene and the optimal depth of insertion of the cannula
• Route of treatment chosen according to presenting signs
• Compatible products for combined approach
  – Injections and tubes together
• Action in case of treatment failure
Cow factors

- Age
- Lactation stage
- Location of affected quarter
- General health
- Previous history of mastitis
- Infection level in the herd
- Level of somatic cells
- Teat canal infections
- Uneven distribution of the drug within the gland
- Circulatory inhibition due to inflammation
Prevention cow factors

- Best-practice selection of cows for treatment or culling
- Identifying and avoiding treatment of teat canal infections
- Appropriate storage conditions for drugs
- Role of general management practices in reducing mastitis incidence
- Impacts of high presence of infection in the herd
Severity of mastitis

- Milk
- Udder
- Cow
Drug factors

- Strep uberis
- Strep dysgalactiae
- Staph aureus
- Coliforms

Drugs: co-amoxiclav, cloxacillin, erytromycin, neomycin, tetracycline
Why new drugs needed

• Decreased efficacy of existing drugs
• No new drugs on the market
• New strains of pathogen emerge
  – Not susceptible to existing drugs
Honours student: Trish Eats

Dairy in my veins

Committed to a great dairy future

Loving the dairy research frontier
The Roseworthy / Luoda Pharma Research Dairy
Animal Husbandry

- 14 a side herringbone
- Shedding overnight initially, paddocked now
- Feedlot with TMR, plus *ad. lib* straw
- Milk 2x per day (12hr interval) with portable milking machines
- Feed moved by trailer, wheelbarrow and shovel
- Milk dumped into Biobin cubes
- Disposal of milk and cows re: biosecurity
Our research at Roseworthy

In the microbiology laboratories:

*In vitro*

- Drug
  - Efficacy
  - Safety

Milk-borne micro-organism
- Culture
- Identification
Our research at Roseworthy

At the dairy:

• Target animal safety
• Preliminary withholding
• Preliminary efficacy

• Other types of studies are proposed and intended...pharmacokinetics, pharmacodynamics, challenge modelling, and much more.
What observations do we take?

Cow:
- Mentation, lameness, recumbency, rectal temperature

Udders:
- Palpation score, thermographic image

Milk:
- Appearance, volume, SCC
Thermal imaging
Milk appearance scale
Palpations

Score 1: medium to hard or foam pillow (http://www.landofnod.com/kids-comforters-and-pillows/kids-bedding/1)
Score 2: bread dough (http://www.seriouseats.com/2012/08/how-to-knead-bread.html)
Score 3: roasting piece (http://www.countrycapitalmeats.com/beef)
Score 4: potato (http://upload.wikimedia.org/wikipedia/commons/a/ab/Patates.jpg)
Score 5: rock hard (including teat) (http://www.sculpture-network.org/en/home/members/all-members/details.html?tx_profile_pi11%5Buid%5D=658&cHash=ba15fd4fac7133a90cf5c103c533e851)
Quarter milkers

Isolate quarters

Analyse separately

More reliable indication of effects

Opening ceremony date TBA!

Come along and visit us and check it all out for yourselves. We’d love a visit.