

# Antimicrobial use in dairy cattle in New Zealand: evidence for change

Scott McDougall

One Health  
AOTEAROA



5<sup>th</sup> Symposium  
WELLINGTON | 2019



# NATIONAL ACTION PLAN FOR COMBATING ANTIBIOTIC-RESISTANT BACTERIA



# UK Five Year Antimicrobial Resistance Strategy 2013 to 2018

# NZVA aspirational statement (2015)

“By 2030 New Zealand Inc. will not need antibiotics for maintenance of animal health and wellness”

# NZVA role in awareness & training

- NZVA policy statements
- Conferences, roadshows & webinars
- Species specific guidelines



**We are proud antibiotic caretakers**

Effective antibiotics have been a key factor in living longer and healthier. Very few issues globally are of greater importance than antibiotic resistance. That's why our veterinarians, working where animals, humans and the environment meet, are leading the way in responsible use of these critical medicines in animals.

The New Zealand Veterinary Association has set an aspirational vision for the future. By 2030 New Zealand Inc. will not need antibiotics for the maintenance of animal health and wellness.

## NZVA policies, guidelines and reports

- AMR Framework: [How we are going to deliver our national strategic aim on use of antimicrobials in managing animal health and welfare](#)
- PwC report: [Antibiotic resistance: Challenges and opportunities. Report to the New Zealand Veterinary Association](#)
- NZVA Guideline: [Guideline for infection control: Reducing the risk of infectious disease transmission for veterinarians](#)
- NZVA Policy: [Judicious use of antimicrobials](#)
- NZVA Guideline: [Antimicrobial use guidelines - Equine](#)
- NZVA Guideline: [Antimicrobial use guidelines - Dairy](#)
- NZVA Guideline: [Antimicrobial use guidelines - Red Meat](#)
- NZVA Guideline: [Antimicrobial use guidelines - dogs and cats](#)
- NZVA Position Statement: [Dry Cow Therapy](#)

# Prescribing guidelines



Antibiotic judicious use  
for the New Zealand veterinary profession



Guidelines for the clinical use of antimicrobial agents in the treatment of dogs and cats



Antibiotic judicious use guidelines  
for the New Zealand veterinary profession

Dairy





Antimicrobials for first line therapy under therapeutic conditions

1. Procaine penicillin
2. Penethamate hydriodide
3. Oxytetracycline



Antimicrobials restricted to specific indications or used as second line therapy under therapeutic conditions

1. Aminoglycosides
2. Semi-synthetic penicillins (ampicillin/clavulanic acid, cloxacillin)
3. 1<sup>st</sup> and 2<sup>nd</sup> generation cephalosporins
4. Lincosamides
5. Potentiated sulphonamides



Antimicrobials considered important in treating refractory conditions in human and veterinary medicine. These will only be used following veterinary diagnosis on a case by case basis with sufficient evidence to indicate need.

1. 3<sup>rd</sup> and 4<sup>th</sup> generation cephalosporins
2. Fluoroquinolones
3. Macrolides

# Infection prevention & control



SHARE THIS



Add page to fav

This section explains how to minimise mastitis and somatic cell counts on your farm using SmartSAMM.

SmartSAMM covers everything from what mastitis is and why it's important to the best ways to manage it on a seasonal basis and where to get help.

Get started today and improve udder health and milk quality:

- Use the **Seasonal Approach** to find better ways to minimise mastitis at each stage of lactation.
- Use the **SmartSAMM Gap Calculator** to work out the economic benefit of achieving your goals.
- Use **Healthy Udder** for quick tips and the right procedures to prevent, find and treat mastitis.
- Use **Find an Advisor** for links to trained professionals who can help improve mastitis and milking management in your herd.

## Seasonal Approach

### Calving



### Lactation



### Prudent use of dry cow antibiotics - what does this mean?

International calls for "prudent" or "judicious" use of antibiotics for food production animals will have implications for how we manage mastitis in NZ dairy herds.

## Healthy Udder

Quick tips for minimising mastitis



# Current usage by animal industries?

## Antibiotic Sales Analysis

*New Zealand Veterinary Journal, 2016*

1

### 2 *Scientific Article*

Ne

**Use of antimicrobials for animals in New Zealand, and in comparison with**

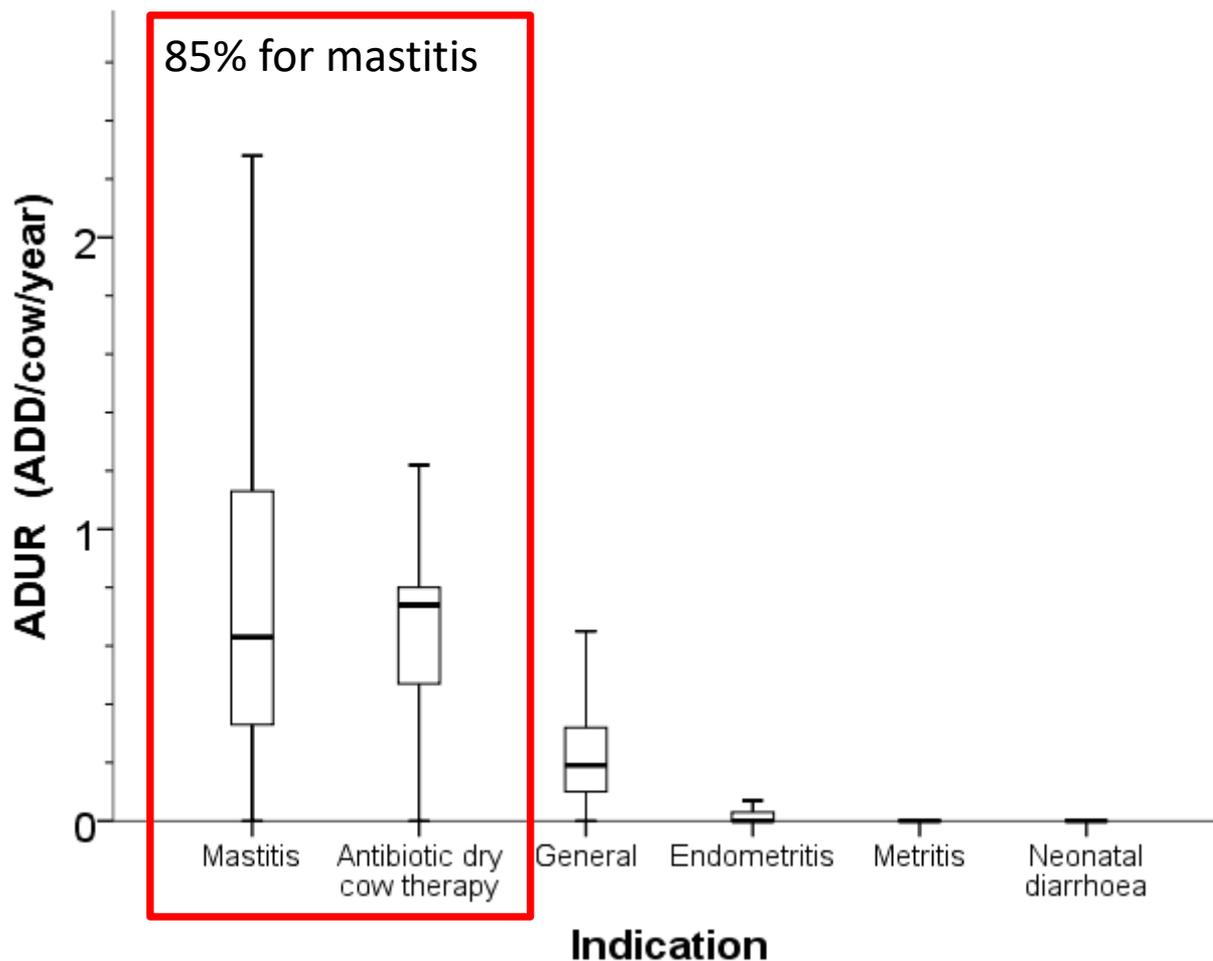
**A survey of antimicrobial use in dairy cows from farms in four regions of New Zealand**

## *Anti-microbial usage on Waikato dairy farms*

*by Chris Compton, Veterinarian, Project Manager, Cognosco, and Dr Scott McDougall, Veterinarian, Director, Cognosco*

# Antimicrobial usage in cattle in NZ

## ADUR by indication (1,251 herd-seasons)



# Veterinarian/farmer interactions

## Milk quality review & Restricted Veterinary Medicines consultations

- Benchmark disease incidence & AM usage
- Identify over/inappropriate usage
  - Overall & by class
- Disease incidence ~ treatment use?
  - i.e. disease diagnosis sensitivity/specificity
- Animal health plans in conjunction with prescribing
- Develop an antibiotic usage action plan for the farm

# Stewardship plan

Herdowner: \_\_\_\_\_

Supply number: \_\_\_\_\_

Email address: \_\_\_\_\_

Vet: \_\_\_\_\_

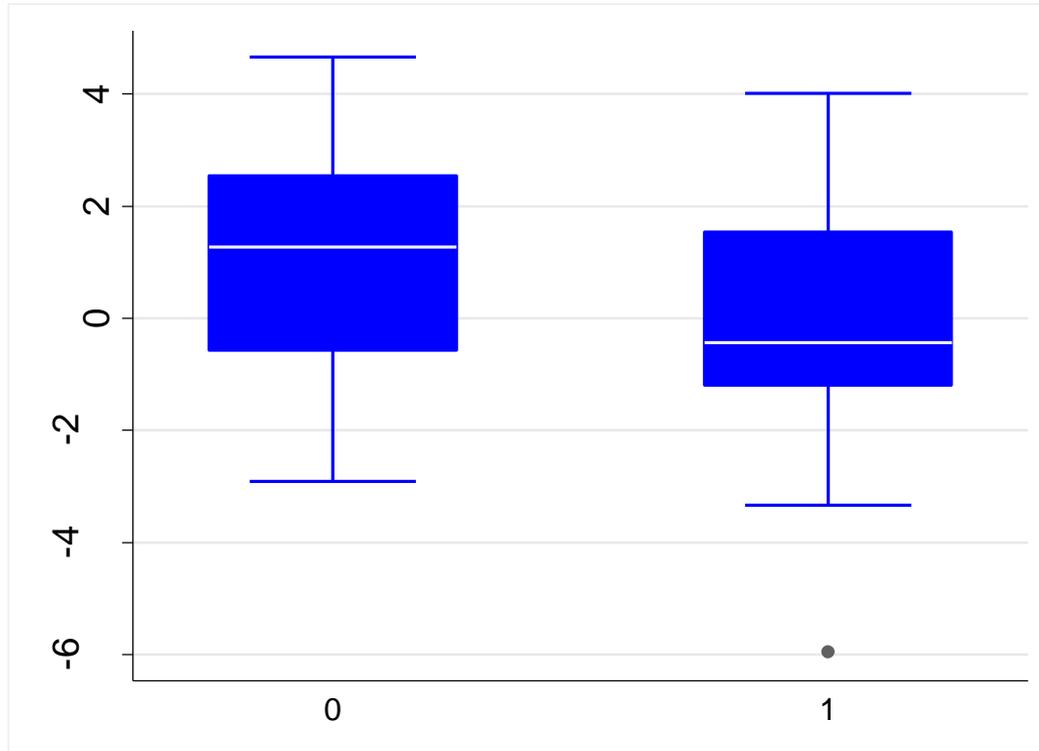
Date: \_\_\_\_\_

Action/goal <sup>1</sup>	Who	When by	Completion date

<sup>1</sup> SMART: **S**pecific, **M**easurable, **A**chievable, **R**ealistic & **T**ime bound

# Plan examples

- Improved mastitis control
  - Develop & use on-farm treatment protocols
  - More culture & sensitivity
  - Improve teat antisepsis
  - Identify multiple repeat clinical cases & stop treating them
  - Improve culling rules
  - Teat seal heifers
  - Use of vaccines



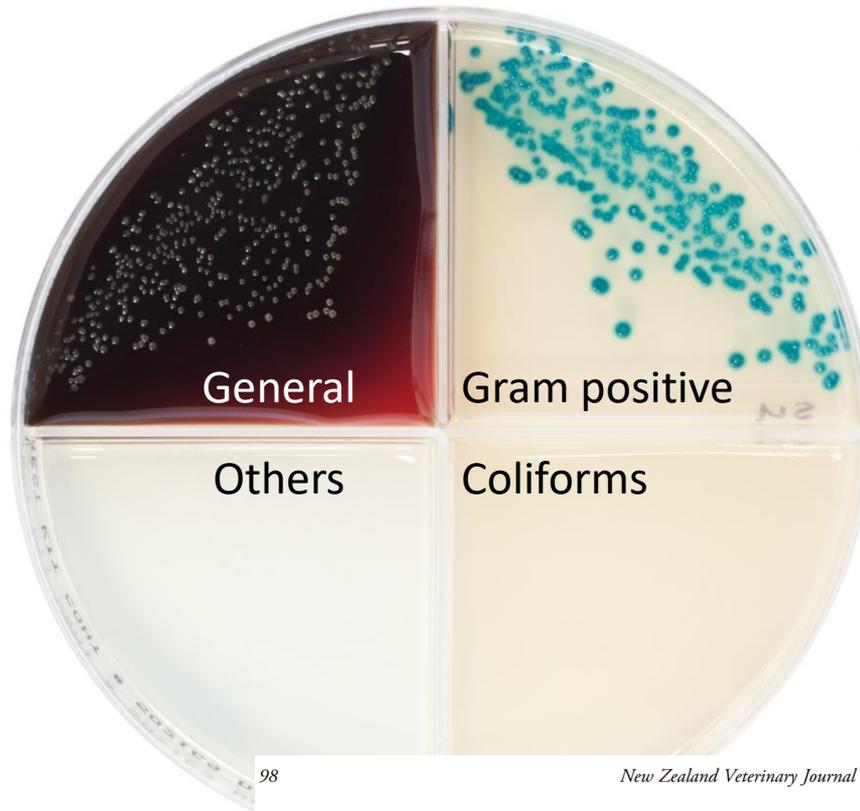
	Change in PCU (mg/cow/yr)	SE
Control	0.94	0.37
Vet visit	-0.04	0.36

P=0.06

Not affected by herd size or island

# Point of care diagnostics

## On-farm culture



Strep uberis

98

*New Zealand Veterinary Journal* 66(2), 98–107, 2018

*Scientific Article*

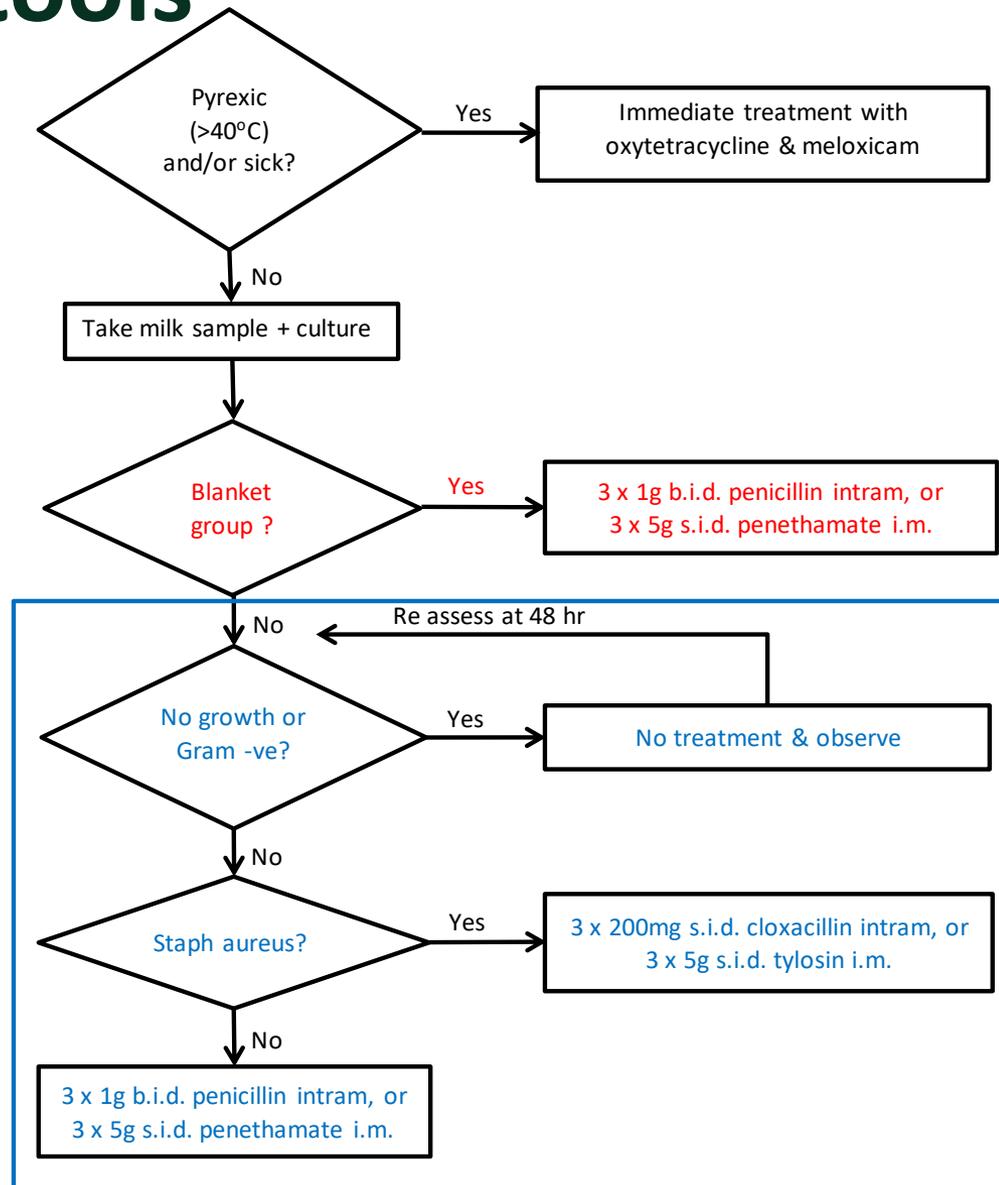
 Check for updates

**Antimicrobial usage and risk of retreatment for mild to moderate clinical mastitis cases on dairy farms following on-farm bacterial culture and selective therapy**

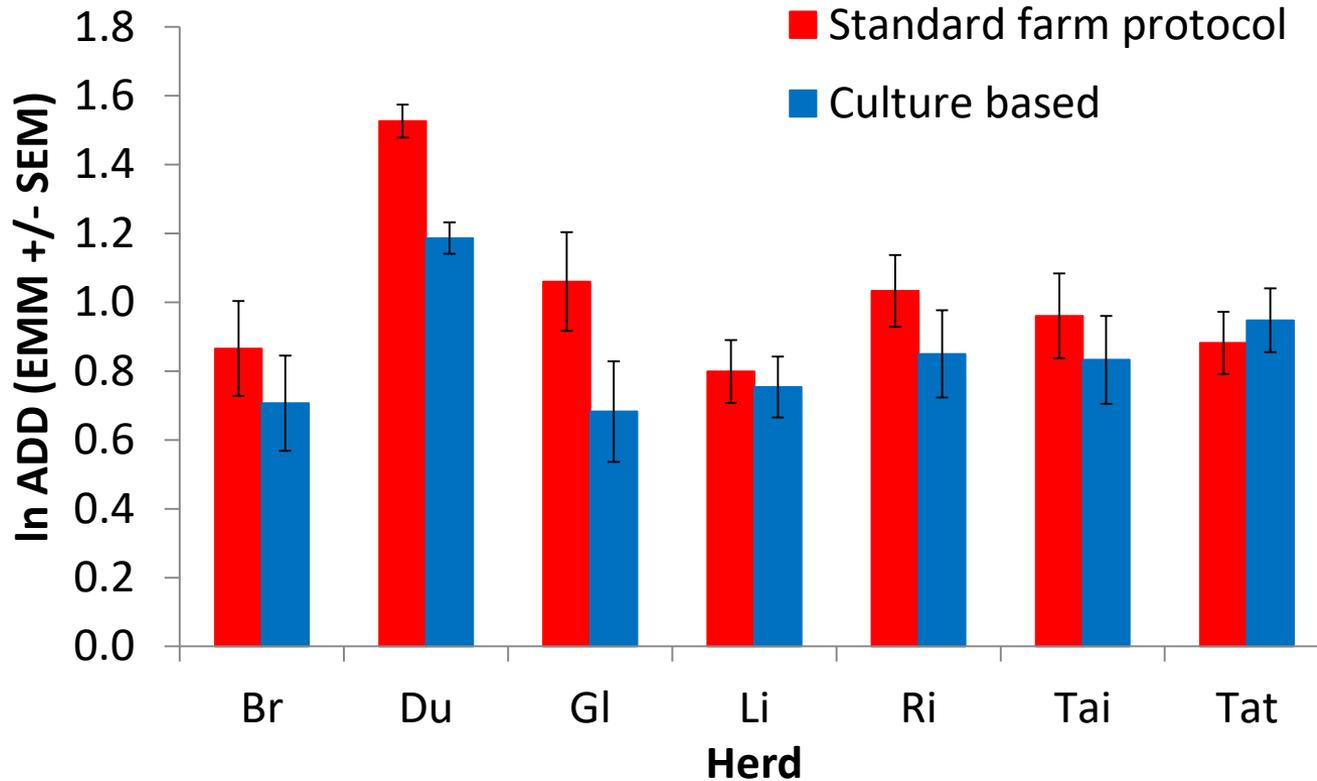
S McDougall\*<sup>§</sup>, J Niethammer\* and EM Graham\*

# Point of care diagnostics

## Decision support tools



# On-farm culture reduces antibiotic use



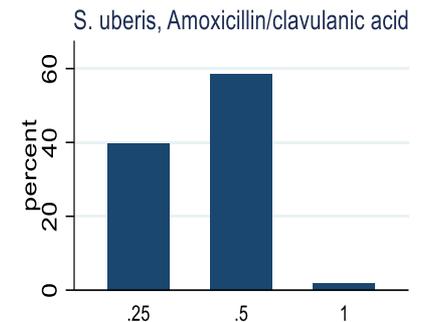
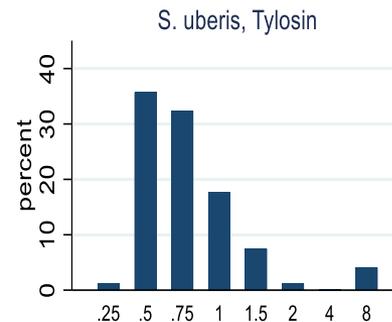
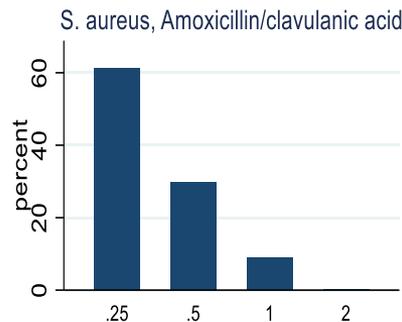
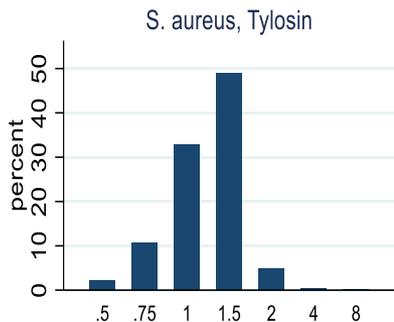
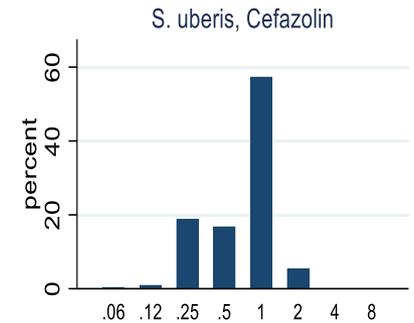
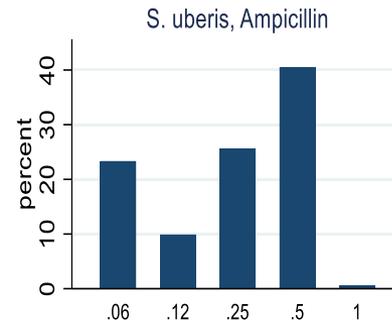
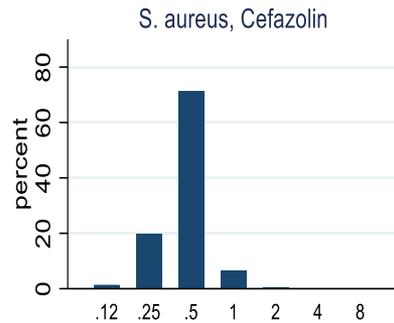
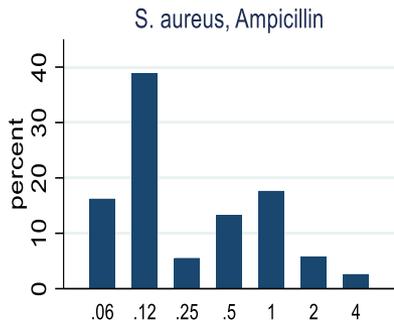
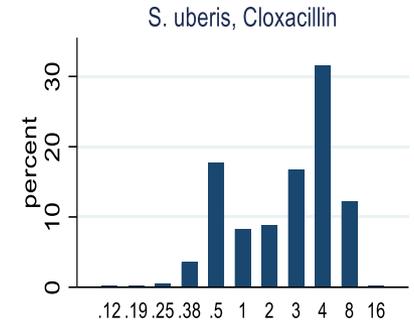
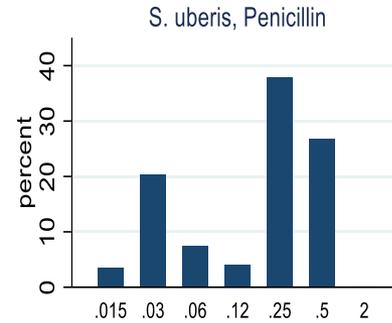
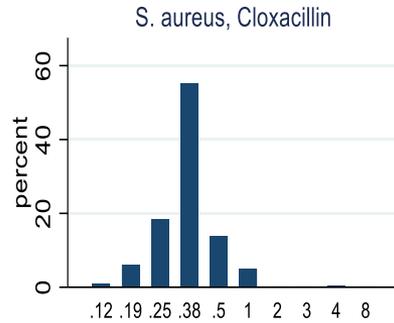
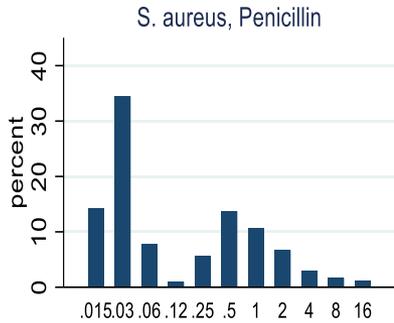
Culture-based In ADD = 1.00 (SEM 0.03) vs  
Standard In ADD = 1.22 (SEM 0.03)  
p=0.005

# Use of isolates from bulk tank milk for antimicrobials sensitivity testing

- Low proportion of infections sampled for culture & sensitivity
- Farmer perception of lack of timeliness, lack of value, and hence low benefit
- Hence sourcing isolates from the bulk tank milk
  - Reduces ‘hassle’ factor for vet/farmer
  - May provide a better estimate of MIC across herd

# *S. aureus*

# *S. uberis*



# 'Selective' dry cow therapy

- Intramammary infusion of antimicrobials “Dry Cow Therapy; DCT” is the most common indication for use of antibiotics in the dairy industry
- “Blanket” DCT is standard in many countries
- But not every cow is infected at dry off
- For uninfected cows, options include
  - No treatment
  - Internal teat sealants

The NZVA recognises that the use of DCT in non-infected cows is no longer appropriate in an era of effective alternatives such as internal teat sealants (ITS) and improved management practices.

By 2020, DCT (Dry Cow Therapy) will only be used in the treatment of existing intramammary infections.



# DCT (dry cow antibiotics) for infected cows only.

This position is supported by:



**NZVA**  
New Zealand Veterinary Association



**DairyNZ**



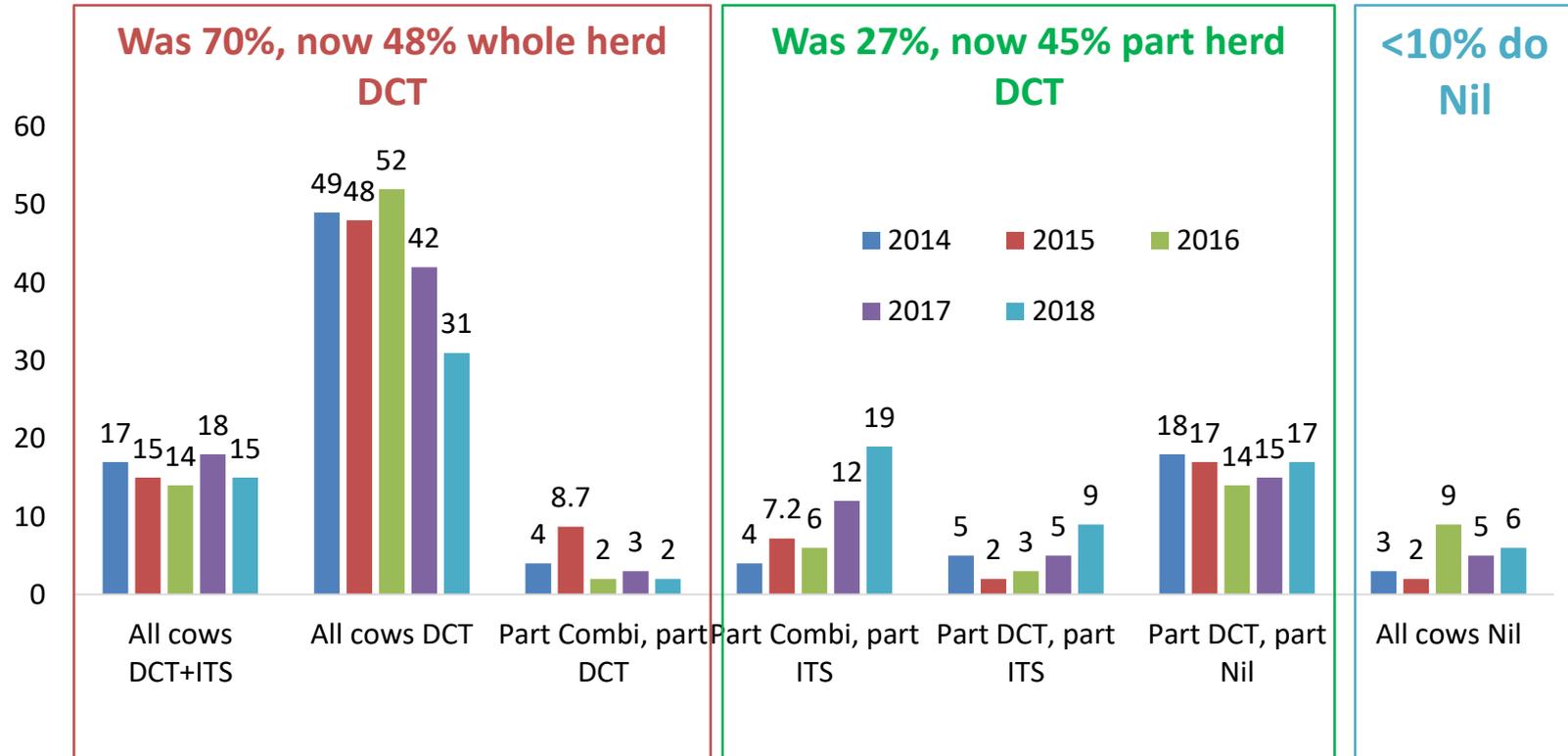
# ***TECHNOTE***

**14**

***Decide dry cow management strategy***

# Have we seen change in antimicrobial usage?

# Dry cow approaches - 400+ farmers/annum



# Where to next?

- The relationship between AMU & AMR in animal industries?
  - Has reducing AMU resulted in reduced AMR?
  - Has there been any negative impacts of reduced AMU on animal welfare or disease outcomes?
- Effect of changes in animal management strategies (disease management and control, effluent management, stock movements et cetera) on AMU/AMR?

# Summary & conclusions

- National Antimicrobial Resistance Action Plan in place (2017)
- Veterinary profession has taken a leadership role
- Increased awareness in veterinary & farming communities of AMU/AMR
- Evidence for changes in overall usage & prescribing patterns

# Acknowledgments

- Farmers and staff involved in studies
- Lab & tech teams from Anexa/Cognosco
- DairyNZ
- Sustainable Farming Fund

**Thanks  
Questions?**

