



A RESEARCH REVIEW™
CONFERENCE REVIEW

30th World Buiatrics Congress 2018



Making Education Easy

28 August – 1 September 2018

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Independent commentary by Mark Bryan

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VetSouth employs 75 vets and has a growing research group with 4 epidemiologists and a number of research technicians. Mark is also a Director of the NZVA, Chair of the NZVA AMR Leadership Group, and a Director at XLVets. Mark graduated from Glasgow University in 1988, and worked in the UK in mixed practice, specialising in production animals. He moved to New Zealand in 1995, joining Central Southland Vets in 1997. In 2002 Mark was awarded a Masters in Epidemiology. VetSouth was formed in 2006.



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Research Review publications are intended for New Zealand health professionals.

Welcome to this review of the 30th World Buiatrics Congress, which was

held in Sapporo, Japan. Presentations on current issues in dairy cow and calf welfare and comfort were independently selected from the scientific programme of the [30th World Buiatrics Congress](#) for inclusion in this review by Mark Bryan of VetSouth. They cover topics including nutrition and metabolism, udder health, antimicrobial use and resistance, and general herd health management.

I hope that the research and insight reported in this conference review are helpful in your practice and I welcome your comments and feedback.

Kind regards

Hamish Newton

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Intensive care of the newborn dairy calf – knowledge into practice

Presenter: Mee JF

Summary: In this presentation, management of the cow at calving and of the calf immediately after birth, investigation of calf losses, and current human perinatal healthcare guidelines were reviewed from the perspective of veterinary practitioner clinical utility. The need for critical care is underlined by almost two-thirds of perinatal calf mortality occurring within an hour of birth and approximately 95% of this loss occurring within five minutes of birth. The human emergency medicine concept of the 'golden hour' (i.e., the period during which there is the greatest likelihood that swift medical intervention will prevent death) is applicable to the intensive care of newborn calves. Numerous calf vitality scoring systems based on the original human APGAR (Appearance, Pulse, Grimace, Activity, Respiration) scoring system have been developed; however, none are widely used in farm practice. Practical indicators suggesting the immediate need for intervention include abnormal calf breathing, poor reflex responses, and poor muscle tone. Good calving supervision, perinatal triage, calf resuscitation, and critical aftercare are the components of a modern step-care model. Perinatal management of newborn calves should include: establishment of a patent airway, normal breathing pattern, and normal circulatory function; prevention of anaemia and prolonged metabolic acidosis; pain relief as necessary; prevention of hypothermia, umbilical infection, failure of passive transfer, and *Mycobacterium avium* subsp. *paratuberculosis* transmission; and calf identification.

Comment: John Mee (Moorepark Research Centre, Ireland) presented some fascinating data on neonatal survival in calves. A lot of the really high-tech solutions were not so relevant to NZ. But the key messages around improving survivability included the concept of the 'golden hour' – the majority of issues are associated with the calving process or immediately after; the development of an APGAR score for calves, which mirrored the highly successful human approach; and the fact that hanging calves upside down to drain fluid was of value. Interestingly, the use of Metacam in all calves post-partum has been shown to significantly improve survival rates.

Reference: *Young Stock: Keynote Lecture K17*

Recurrent mastitis – persistent or new infections?

Presenter: Kroemker V

Summary: Because different causes of recurrent mastitis require different management, the objective of this study was to identify the range of persistent cases and cases of re-infection within recurrent cases of mastitis. Milk samples of clinical mastitis cases were collected on three Northern German dairy farms. In total, 2,380 mastitis cases were examined at quarter level (1,160 first cases in lactation, 1,220 recurrent cases in lactation). In 220 recurrent cases, the same pathogen species compared to first cases was identified. Using molecular biological analysis methods, in 130 cases the same bacterial strain as in the first cases could be confirmed. Most (approximately 90%) of the recurrent cases were new infections with other bacterial species or strains.

Comment: Volker Kroemker (University of Hannover, Germany) presented on recurrent mastitis and asked if infections were new or persistent. He reviewed milk samples of clinical mastitis cases from three Northern German dairy farms from 2011 to 2015 (2,380 cases). Forty percent of cases were *Streptococcus uberis*. There were 1220 cases that were recurrent; and of these, around 15% (220 cases) were the same species. He used a RAPD PCR test to determine strain types and found that in only 51 cases (4.2% of all recurrent cases) the same bacterial strain as in the first cases could be confirmed. He concluded that the prevention of infection was far more important than the treatment.

Reference: *Udder Health and Milk Quality: Oral Presentation UH-01*



Phosphorus balance in muscle tissue and muscle function in dairy cows undergoing dietary phosphorus deprivation during the transition period

Presenter: Gruenberg W

Summary: Phosphorus (P) deficiency is believed to be associated with periparturient recumbency in dairy cows. The objective of this study was to determine the effects of dietary P deprivation on muscle P homeostasis and muscle function in transition dairy cows. Thirty-six dairy cows in late gestation were randomly assigned to either dietary P deprivation from 4 weeks before to 4 weeks after parturition or to a control treatment with adequate dietary P supply. P deprivation resulted in pronounced hypophosphatemia without causing any signs of clinically apparent muscle weakness or recumbency. Analysis of different P-containing compounds in muscle tissue showed minor changes over time. A treatment effect, however, could not be identified for any of the biochemical parameters studied in muscle tissue. Electromyographies of biceps-femoris muscles did not reveal significant treatment effects. However, subtle treatment effects suggestive of mild neuromyopathy were observed in intercostal muscles. In addition, pathologic spontaneous activity of intercostal muscles became more frequent over time in P-deprived animals.

Comment: Walter Gruenberg (University of Veterinary Medicine Hannover, Germany) presented on the homeostasis of P, which is of relevance to many of us whose clients feed fodder beet over winter. His trial design had a normal group and a group with a diet significantly deficient in P for 11 weeks pre-calving (0.15% vs 0.28% for the controls). There was a rapid decline in serum P levels in the low P group, and 3/18 cows developed haemoglobinuria; but remarkably only the control group (4/18) experienced any clinical signs of hypocalcaemia post-partum. He suggested that there was a lot more we needed to understand about calcium and P homeostasis before we make blanket recommendations to farmers.

Reference: *Nutrition and Metabolic Diseases: Oral Presentation NU-02*

Intravenous calcium supplementation at calving induces fluctuations in circulating calcium and hypocalcaemia when compared to voluntary oral calcium supplementation

Presenter: Wilms J

Summary: This study assessed the efficacy of prophylactic treatments to mitigate hypocalcaemia at calving by monitoring serum total calcium (tCa) and ionized Ca (iCa) in 24 multiparous Holstein cows after parturition. Cows were blocked by calving sequence and by calcaemic status at calving in two categories: normocalcaemic (iCa >1.10 mmol/L; n=8) or hypocalcaemic (iCa <1.10 mmol/L; n=16). Cows in each block were randomly assigned to two treatments: Ca-Oral (n=12) given as a Ca suspension (47.7g Ca in total) or Ca-IV (n=12) given as a 450mL IV Ca solution (12.5g Ca in total). Pre-calving diets were formulated with a positive DCAD (dietary cation-anion difference) of 182 meq/kg dry matter (DM) and contained 4.1g Ca/kg DM. Treatments were administered once immediately after parturition. The incidence of calving-related disorders during the first 30 days of lactation did not differ significantly between treatment groups. In the Ca-IV cows, both iCa and tCa concentrations peaked at 1 hour (1.52 mmol/L for iCa and 2.88 mmol/L for tCa) and declined to a nadir at 24 hours post-partum (0.94 mmol/L for iCa and 1.74 mmol/L for tCa). Although iCa and tCa were higher at 1 and 3 hours in Ca-IV cows (p<0.0001), the concentration of iCa was greater for Ca-Oral cows at 24, 36, and 48 hours (p<0.05) and for tCa at 36 hours (p<0.05).

Comment: Juliette Wilms (Netherlands) presented on a comparison of supplementing oral vs IV calcium at calving. This was only a very small study (total n=24) and was with cows that were clinically normal. They were bled and divided into normocalcaemic and hypocalcaemic groups; and then randomly assigned to either 12.5g of Ca IV or around 47g of oral Ca by voluntary intake. Cows were then bled every 12 hours until 60 hours post-partum. Although there were no clinical differences recorded up to 30 days post-partum, the IV-treated cows rapidly became hypercalcaemic but then rapidly hypocalcaemic, with their serum Ca levels dropping below those of the oral Ca group from 24 hours post-partum. The conclusion was that treating clinical hypocalcaemia needs IV treatment; but prevention may be better as oral Ca.

Reference: *Nutrition and Metabolic Diseases: Oral Presentation NU-04*



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Managing clinical mastitis to minimize antibiotic usage

Presenter: Ruegg P

Summary: This presentation described research-based principles that can help veterinarians work with farmers to ensure responsible and justifiable antimicrobial use (AMU) for the treatment of clinical mastitis. Based on survey data, treatment of mastitis accounts for the majority of antimicrobials given to dairy cows and most cases are treated symptomatically, without knowledge of aetiology. When antimicrobials are routinely used to treat mastitis without knowledge of aetiology, approximately 35–60% of antimicrobial treatments will be of no-benefit to the cow. There is considerable opportunity for veterinarians to promote responsible AMU through increased engagement with farmers in the development of mastitis treatment protocols. Appropriate AMU for mastitis treatment is based on assessment of the aetiology and medical history of the cow and application of sound therapeutic principles to select approved antibiotics.

Comment: Pamela Ruegg (Michigan State University, US) presented on managing clinical mastitis to minimise AMU. Her data suggested that antimicrobial treatment didn't improve longer term cure rates but did speed up the cure process. She emphasised the importance of culturing pathogens, because SCC reduction and all other outcomes vary by pathogen. She also suggested that narrow-spectrum drugs should be the first-choice option, and that shorter courses were preferable. These data are important when considering approaches to reducing AMU, given that the majority of all AMU is used for udder health.

Reference: *Udder Health and Milk Quality: Keynote Lecture K16*

Veterinarian communication on herd health: a feasibility study of Motivational Interviewing and farmer change language

Presenter: Reyher K

Summary: The aims of this study were to examine: (i) the effect of brief motivational interviewing (MI) training on veterinarian use of MI consistent and MI inconsistent communication behaviours; and (ii) the effect of brief MI training on farmer change language. Practicing cattle veterinarians (n=14) attended brief MI training and recorded an audio file of advisory communication on 'any change for the benefit of herd health' before and after the experience. A brief MI training experience resulted in a significant (p=0.001) increase in veterinarian use of MI-consistent skills, a significant (p=0.009) decrease in veterinarian use of MI-inconsistent skills, and a significant (p=0.006) increase in positive farmer change language.

Comment: Kirsten Reyher (Bristol University, UK) presented a study of 'Motivational Interviewing' and how veterinarians communicate with farmers. The key aspect is that as veterinarians, we tend to speak in a very directive style, which is essentially instructing people how to do things. The goal was to demonstrate if a different form of communication could be more effective. The project involved recording, transcribing, and analysing farmer-vet interactions, and then determining some key outcomes. What she found was that veterinarians can change the way they communicate with farmers; and that can be a means to effect change in farmers. It was a highly effective tool.

Reference: *Herd Health Management: Oral Presentation HH-02*

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Recumbency at slaughter premises: A case-control study

Presenter: Laven R

Summary: At five abattoirs across NZ, all dairy cattle that arrived recumbent, but alive, or became recumbent between arrival and slaughter were eligible for the study. Three controls were selected per case: (1) an ambulatory cow from the same farm as the case; (2) a normal cow from a group with no recumbency that arrived prior to the case; and (3) a normal cow from a group with no recumbency that arrived prior to the case. A veterinarian questionnaire was provided for all cases and all controls. Blood samples were taken from all case and control 1 and 3 cows. Compared with control 1 cows, case cows had significantly greater odds of having increased creatinine kinase activity (odds ratio [OR]: 4.3) and decreased calcium and phosphorous concentrations (OR: 5.4 and 5.1, respectively). The same biochemical changes were seen when case cows were compared with control 3 cows with similar ORs. No evidence was found of an association between hypomagnesaemia and recumbency or ketosis and recumbency. The odds of recumbency increased 1.3-fold for every 100km increase in distance travelled, i.e., the odds of a cow being recumbent rather than ambulatory when it had travelled the longest distance in this study (825km) were >10-fold that of the cow that travelled the shortest distance (1.5km).

Comment: Our own Richard Laven (Massey University) presented a case-control study looking at the risk factors for recumbency in cattle at slaughter. Seventy-one cases were matched with three different controls, giving a dataset of almost 300 animals. Along with a comprehensive survey questionnaire, cows were bled for physiological markers. There was no effect of age, body condition score, or pregnancy status on the risks of recumbency. Hypocalcaemia and distance travelled were the greatest risk factors for recumbency. Cows that spent the night in the lairage, rather than being slaughtered the same day, were also at higher risk of recumbency. There is a need to better manage cows prior to transport (focus on calcium requirements), as well as improving transport and holding management for those cows.

Reference: *Bovine Welfare and Cattle Comfort: Oral Presentation WE-11*

The risk of iatrogenic sciatic nerve damage in dairy cattle when injecting into the dorsal gluteal region

Presenter: Kirkwood R

Summary: This study described the position of the sciatic nerve in dairy cattle and evaluated the risk of damaging the sciatic nerve when injecting commonly-used products into the dorsal gluteal region. Fifty-four participants (veterinarians, veterinary students, and farmers) injected into the dorsal gluteal region of dairy cattle cadavers and their injection sites were recorded. Measurements of injection site location and sciatic nerve location were combined to indicate needle position in relation to the nerve. Seventy per cent of participants confirmed that they use the dorsal gluteal region as their most common site for IM injection. In addition, 69% of injections were located in close proximity (<5cm) to the sciatic nerve. The average intra-participant variability was approximately 32cm², which represents the surface area in which 10 injections on the same site would occur, given by the same person.

Comment: Rosanna Kirkwood (Nottingham University, UK) presented on iatrogenic sciatic nerve damage in dairy cattle. This was the highlight of the World Buiatrics Congress – she enrolled farmers, veterinarians, and students (n=54) and recorded whether they considered themselves experienced or not. They were asked to inject into the dorsal gluteal area in four cadavers and she then measured the proximity of the needle end and shaft to the sciatic nerve. Sixty-nine percent of all injections were located within 5cm of the centre of the nerve. This was a higher risk in low body condition score (BCS) cows (i.e. all of NZ). Her advice was to use the neck; or to use a lateral site immediately behind the tuber coxae, particularly in lower BCS cows. (It is worth noting that in NZ any IM injection not given in the neck is off-label use.)

Reference: *Bovine Welfare and Cattle Comfort: Oral Presentation WE-12*

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“It’s cheaper than a dead cow”: Understanding veterinary medicine use on UK dairy farms through qualitative methodology

Presenter: Rees G

Summary: In this study, 20 UK dairy farmers were recruited through their veterinarians and answered an in-depth face-to-face interview to investigate their attitudes, beliefs, and values in relation to the storage, recording, and actual use of veterinary medicines. In addition, three dairy farms were recruited for a 12-month intensive participant-observation study. Several important themes were identified: trust (in the farm staff, the veterinarian, and the medicine); risk (of using versus not using a particular medicine); and past experience and the concept of medicine effectiveness being specific to “this farm”. Additionally, ethnographic work identified social conflict and a struggle for power and agency relating to medicine use between key decision makers on-farm. It was apparent that licensed dosing regimens were regularly exceeded for various reasons. Risk-averse behaviour was commonly documented. The key factors influencing decisions about medicines were: advice from the farm’s veterinary surgeon, advice from peers, and personal anecdotal experience from perceived past successes or failures. Availability, cost, and withdrawal periods of medicines also influenced the selection of medicines used in different situations. Farmers were aware that their access to certain antimicrobials may soon be limited; however, there was varying understanding of the antimicrobials involved and the full reasons for this.

Comment: Gwen Rees (Bristol University, UK) presented on why dairy farmers use antimicrobials. She made the point that quantitative analysis of the amounts used was straightforward but understanding the behaviour behind use was more complex. She recruited 20 dairy farmers and interviewed them at length; and in turn followed three farms through for a full year with many on-farm visits. Veterinarians were found to be the most trusted source of information on antimicrobial use, but not the sole source. Farmers develop their own disease understanding that may be quite different to ours as veterinarians. Farmers also have a strong sense of ‘wanting to be a good farmer’; and that their farm is unique.

Reference: *Antimicrobial Resistance: Oral Presentation AR-01*

What can we learn from farmers experiences and attitudes to Selective Dry Cow Therapy?

Presenter: Orpin P

Summary: This presentation reported the results of an electronic convenience survey of 496 farmers to establish the attitudes of farmers to selective dry cow therapy (sDCT) together with their experiences and future requirements. Data analysis was based on the farmer attitude (belief and importance) and revealed different results for four different groups: pro-activists, unconcerned, deniers, and disillusionists. Eighty-two percent of farmers believed that reducing antibiotic usage would be good for their livestock but 54% feared that sDCT would result in death or mastitis without antibiotic use. Significant concerns existed regarding cell counts not being controlled effectively (42%), high cell counts developing (39%), and risk of more mastitis in following lactation (33%) or severe mastitis occurring (24%). Eighty-two percent of farmers believed it would be good for their livestock to reduce antimicrobial use. Approximately 50% of the farmers classified themselves as firm believers and would recommend sDCT to other farmers (proactivists), 18% agreed it was a good idea but low on their priority lists (unconcerned), 15% did not believe it worked or had had bad experiences previously (disillusionists), and 1.5% did not believe in sDCT (deniers). Dividing the farmers into three groups – proactivists, unconcerned, and disillusionists – revealed that the requirements to engage each group differed. The proactivists were driven by more on-farm training on sDCT (30%) and help from their veterinarian (13%). Contrastingly, only 6% of the disillusionists group were motivated by on-farm training. The unconcerned group needed more convincing that the rewards outweighed the benefits (42%) and more evidence that sDCT worked (37%). A Net Promoter Score (NPS) revealed that there were more detractors (51%) than promoters (26%) indicating that without external support and encouragement the programme may fail if relying on farmer recommendation alone.

Comment: Peter Orpin (Leicester, UK) spoke on farmers’ attitudes to sDCT. A total of 496 farmers were surveyed to establish an understanding of their beliefs, values, and attitudes towards using sDCT, using a free-text survey approach. An NPS was calculated. Based on their responses, farmers were able to be divided into three groups, based on whether they were proactive supporters of sDCT, unconcerned, or disillusioned. There were differences in how each group could be successfully engaged – for the proactive group, on-farm training and veterinary help were of key importance. A number of farmers were concerned about deaths associated with sDCT.

Reference: *Antimicrobial Resistance: Oral Presentation AR-02*

Virbac NZ products take the stage at the 30th World Buiatrics Congress

The 30th World Buiatrics Congress in Sapporo, Japan, included three Oral Presentations from Virbac New Zealand sponsored trials. A summary of the key points of each study is below.

1 The use of 'in clinic' milk culture to determine prevalence of clinical mastitis in four dairying areas of New Zealand. Mick Clews, Alistair Kenyon, Katy Johnston, Steve Oehley, Hamish Pike, Kate Taylor, Kristina Wyatt.

This study investigated whether case by case diagnosis and treatment of mastitis using in-clinic culture was effective in New Zealand conditions. The main findings were:

- Case by case treatment resulted in similar overall cure rates, with a significantly higher cure rate for *Staph. aureus*.
- A case by case treatment protocol used less average daily doses of antibiotic and more green rather than orange antibiotics.
- 3 x 12 hourly treatments with Intracillin® 1000 Milking Cow provided significantly better cure rates in *Strep. uberis* than 5 x 24 hourly Orbenin® LA (76.3% vs 61%, $p < 0.05$).
- 3 x 12 hourly Intracillin® 1000 Milking Cow followed by 3 x 24 hourly Penclox™ 1200 HPMC resulted in significantly higher cure rates for *Staph. aureus* than 5 x 24 hourly Orbenin® LA (47.1% vs 21.4%, $p < 0.05$).

2 The effect at herd level of more frequent testing for endometritis and subsequent treatment of positive cows with a single intrauterine infusion of 500 mg Cephapirin compared to a more traditional single test and treatment. Mick Clews.

This study sought to compare proactive early diagnosis and treatment of endometritis with Metri-Clean™, with traditional treatment a month prior to mating. Significant results included:

- Individual cows conceived 8 days earlier and had 3.2% higher 84-day pregnancy rates if treated early.
- Across herds conception was two days earlier and 84 day pregnancy rates were 1.65% higher.
- The extra cost of early treatment was estimated at \$7.50/cow, for a return of \$26-\$33 i.e. a 3.4-4.4 times return on investment.

3 Effect of an injectable trace mineral supplement containing Selenium, Copper, Zinc, Manganese and Chromium on mortality, morbidity and growth of dairy calves. Andrew Bates, Matt Wells, Richard Laven, Meg Simpson.

The aim of this study was to determine if early treatment with Multimin® + Cu, with Chromium would improve the health and growth of calves. To determine the best timing of treatment for maximum effect calves were injected within 24 hours of birth and/or at 35 and 70 days of age. Key findings were:

- Both morbidity and mortality rates were approximately halved by treatment at any of the 3 timepoints.
- As the peak of death and disease is in the first 35 days, treatment within 24 hours of birth had the biggest impact, followed by the 70 day treatment.
- Growth rate differences were very small at 17 g/day, suggesting calves were not clinically deficient in trace elements.



If you would like further information on any of these studies, please talk to your Virbac Area Sales Manager or visit us at nz.virbac.com

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