

Preparations are in earnest for the 2014 Conference of the NZSAP in Napier, from June 30th to July 1st. It has been 8 years since we last had the conference in Napier, if my memory is correct. I still remember that conference because of the animated discussions about the results from the World Cup (soccer, that is!). Was Australia robbed of that last minute penalty against Italy? Would that resulted in Zidane head-butting an Australian in the final, instead? This year will be a bit of *déjà vu* as I imagine our conference will be peppered by side-line commentary on the latest match results. Anyway, I went off topic... call it an 'off-side'.

So back to Napier this year, where the Convenors will be trying a new format for the conference in terms of duration and fieldtrip. Read more about it in this newsletter. One of the reasons for a shorter conference this year is the number of papers submitted for the conference, which could be accommodated in the shorter format. So that could be good for some reasons, but I would like to bring attention to that. As a society, I am sure that we should be more concerned about quality than quantity, but it is worrisome to see our Proceedings book getting thinner and thinner every year. What is the driver behind this trend? While some of the thinning of the book could be explained by our move to 'short communications' involving less pages per manuscript, the reality is that we should not ignore the trend. New Zealand owes a lot of its revenue to exports from the agriculture sectors, with livestock industries making a large proportion of it. The agricultural sector is facing many challenges, particularly in the form of 'farming within limits', which need scientific and technological innovation to be solved. We, professionals in animal production and animal science, are tasked with 'delivering the goods' that will allow sustainable (environmentally and economically) farming in NZ. Given what the livestock and agricultural sector means for the livelihood of the country, it is important that our association remains vibrant and active... to foster that exchange of ideas that leads to innovation. I know that number of papers submitted is not the only indicator of vibrancy and vitality, but maybe it is something we can discuss at our get together in Napier. What can we do, as a society, to entice more members to submit scientific papers to the Society's proceedings? As a committee, we have been exploring visibility and availability of the research published in the Proceedings. This may or may not be a factor in the decline, though. There could be other factors that need to be identified, so please bring your 'thinking hats' to Napier.

It is time to give a thought about being part of the Management Committee. There will be positions vacant as some of our long-service members leave the committee. If you are

interested, or know somebody who could be interested, please get in touch with any of the members of the Committee to know more about what is involved.

Look forward to seeing you in Napier in a few weeks.

David Pacheco

NZSAP President

The opinions expressed in this Newsletter are bloody good ones, but are not necessarily those of the NZSAP

VERY IMPORTANT NOTICES

IF YOUR SUBS ARE NOW **OVERDUE**
PLEASE SEND THEM TO KATE CROOKSON, EXECUTIVE SECRETARY ASAP

NZSAP CONFERENCE 2014

The 2014 NZSAP conference will be held in **Napier at the Napier War Memorial Conference Centre on Monday 30 June and Tuesday 1 July.**

The conference will open at **6.00pm on Sunday the 29th June with Quiz night and nibbles and conclude at 4.00pm on Tuesday 1st July.**

The Landcorp Lecture will be delivered by Dr Peter Janssen, AgResearch entitled Rumen Microbial Community Profiling as a Tool to Study Ruminant Production

The Living Legend Lecture will be given by Dr Geoff Nicoll entitled The sire breeding programmes of the Department of Lands and Survey and Landcorp Farming Limited

Registration details are available soon via the NZSAP website www.nzsap.org.nz

Unfortunately there was not enough interest in the field trip so this has been cancelled.

HIGHLIGHTS

In addition to a broad range of contributed papers, the programme also features two contracted sessions - **Alternative Forages** and **Farmer Learning**

2014 ANNUAL GENERAL MEETING OF NZSAP

The 74th Annual General Meeting of the New Zealand Society of Animal Production Inc. will be held at the Conference Venue Napier

Agenda

Apologies
Minutes from 2013 Meeting
Matters Arising
Presidential Report
Treasurer's Report
Editor's Report
Publication Manager's Report
Election of Officers
Next Conference
General Business

New Zealand Society of Animal Production

Annual General Meeting Minutes

Meeting Date : 02 July 2013

Meeting Time : 17:00 h

Meeting Place Conference Room 4, Kingsgate Hotel, 100 Garrett Ave, Te Rapa, Hamilton

President Paul Kenyon declared the meeting open at 17:05 h on the 2nd July 2013.

In attendance: 49 members.

Apologies

John Smith, Grant Edwards, Dave Clark

Apologies received and accepted. Moved: Paul Kenyon. Carried.

Minutes of previous AGM

Motion that the minutes of the AGM on 2nd of July 2012, circulated in the newsletter are accepted as a true and correct record.

Moved: Paul Kenyon Seconded: Roland Sumner. Carried.

Matters arising from the minutes

None

President's Report

Key points:

- Objectives of the society are being met. In general, the NZSAP is to:

- Provide an organisation to bring about active collaboration among those involved in the science of producing food, fibre and other products from livestock
- Assist young people in a manner which develops an interest in the science of food and fibre production
- Promote the value of science in the development of animal production
- Usual activities during the year have been:
 - Administering the Young Members award and other Society Awards including travel awards,
 - Publishing the conference Proceedings,
 - Developing and published a new Occasional Publication
- Continued to strengthen relationship with Australian Animal Production Society
- Website has been updated using the profit from the last joint conference (2012 conference)
- New young scientist award: Murray Woolford Award
- Number of applications for Young Member Award are down.
- Vote of thanks to the members of the 2012-13 Management Committee of the NZSAP and also to the 2013 Organising Committee of the Annual Conference. Special thanks to outgoing committee members Vicki Burggraaf (Treasurer) and Roland and Rell Sumner (Proceedings Editor).
- Also acknowledgement of representative for the Society
 - Jenny Juengel – International Congress for Animal Production
 - David Scobie – National Animal Welfare Advisory Committee
 - Penny Back – Spragg Agricultural Trust
 - John McEwan – AgResearch Genomics Award Committee
 - Patrick Morel – Editorial representative for the Asian-Australian Journal of Animal Sciences
 - Jane Kay – assisting Executive Secretary
- Membership at 430 members. Number may not be accurate as some are unpaid (approx 130 unpaid).
- New membership process:
 - Prospective member applies online and it is approved by members of the committee
 - If haven't paid within 3 months then lose access to website. Then 2 years non-financial before taken off database. Previously this was 3 years so next year may see a sudden reduction in membership number
 - Those non-financial members that wish to renew membership will have to back-pay for fee for missed years. Noted that this may discourage re-membership.
 - The constitution states that two people are required to act as referees/vouch for new members. Is this actually in the constitution? Can this be removed?
 - Discussion points:
 - Need to get onto creating a constitutional change as needs to be decided at AGM.
 - The caution is regarding special interest groups that may seek membership reasons unrelated to the Society's objectives.
 - May not need a constitutional change. Committee could seek two members that are likely to know the potential member and request them to be referees.
 - Just because gone online doesn't negate the possibility of having two referees.
 - Most people are requesting committee to second anyway. So how is committee to know if a person is genuine?

- Do we know who the non-payers are? Non-payers seem to be from a range of backgrounds.
- What proportion of members from within Universities, CRIs etc vs. “unknown”? Could get local members to check on potential members?
- Potential members could sit on list for 3 months to see if any objections arise. Complication associated with taking the fees and holding them for 3 months.
- Could we expel those members that we find don't have a vested interest aligned with Society's objectives?
- Suggest that give leave to the committee to check the constitution regarding the ability to expel a member. If there is a clause, go away from needing two referees. If member is of issue then we can go back to the default of expelling the member. If clause doesn't exist then put the clause into the constitution.
- Committee needs to have ability to investigate and make a decision...
- Membership form could have terms and conditions in regard to the membership and abiding to Society objectives with clause that Society has the right to expel

Move that the Society gives leave to the committee to check the constitution regarding the rights of the Society to terminate membership. If we have the capability to terminate membership then the membership joining process will change so that the potential member does not require two referees. If don't have the right to terminate membership then we will keep the status quo with two referees required. Will reconsider the joining process again next year.

Moved: Penny Back, Seconded: David Pacheco. Carried

- Next Joint NZSAP/ASAP Conference will be in Adelaide in 2016
- Awards in 2012:
 - McMeekan Memorial Award: not awarded in 2012
 - Sir Arthur Ward Award: not awarded in 2012
 - Young Members Award: Q Sciascia
 - Lincoln University Centennial Award: M & S Latham
 - NZSAP Jubilee Anniversary Award: H MacIntyre (Lincoln), M Turnbull (Massey)
 - NZSAP Innovation Award: S Mros et al.
 - Landcorp Farming Ltd Lecture: KL MacMillan
 - Living Legend Lecture: AM Nicol
- Travel Awards 2012:
 - Animal Science Awards: Nicola Schreurs, Agustin Rius, Jenny Jeungel, Paul Long, Nicola Priest, Kristina Mandok, Grant Shackell
 - AgR Animal Genomics: Hannah Maria Henry, Matt Bixley, Martyn Donnison, Milica Ceric
 - Note: to be eligible for awards, applications need to be in on time. Timing is important, check deadlines for awards.
- Sponsorship: Otago Science Fair
 - Note: the Society welcomes opportunities to provide sponsorship

Move that the President report be accepted. Moved: Paul Kenyon Carried.

Treasurer's report.

Presented by Vicki Burggraaf.

Hard copies of the Annual Financial report for the year ended 31 December 2012 were made available at the meeting for the members attending the AGM.

Key points:

- Revenue of \$220,575, expenditure \$191,530. This resulted in a net surplus (after impairment of investments) of \$36,016 (however, \$25,000 associated with Murray Woolford Award and \$5000 is conference profit that goes to the Australian Society).
- Main items in revenue were:
 - Conference income of \$113,348 which is approximately \$48,000 greater than previous year due to the 2012 conference being a joint conference with the Australian Society
 - Donations of \$27,694. Approx \$3000 for sponsoring the Landcorp Lecture and in 2012 an additional \$25,000 which will be invested for the Murray Woolford Travel Award Award (new award)
 - Interest similar to previous year
 - Although membership is lower subscriptions and publications income was up by approx \$1000
 - Publications income: Proceedings sales down slightly but CD ROM and OP sales up. Still getting good sales from OP14
- Main items in expenditure were
 - Accounting fees is the balance between quoted and actual cost
 - Conference expenses: \$107,798. Still made conference profit and approx \$5000 (which is half of profit) was allocated to Australian Society.
 - Awards \$25,300, both NZSAP awards and AgR Genomics were up on previous year. \$15,500 for Animal Science Awards. AgR Genomics had 4 awards in 2012.
 - Wages/PAYE up slightly to account for increased time for Exec Secretary to learn role.
 - Rest comprised of administration expenses, printing and publication costs that are similar to previous year.
- Closing equity was \$636,221
 - Current assets: Approx \$2000 lower than 2011. Autocall account lower due to reinvestment of some of the funds.
 - Non-current assets: Awards accounts and Bonds have increased in value.
- Murray Woolford Young Dairy Scientist Award
 - New award
 - Have received funds for investment – contribution in memory of the late Murray Woolford who was a scientist at DairyNZ.
 - Aim: to provide opportunities for early career scientists (within 10years from receiving PhD. To develop links, networks, new skills. It is intended to support new technical skills and exposure to new ideas that may provide useful to the NZ dairy sector.
 - Applicants need to be a financial member of the Society for at least 12 months and have experience/worked in a NZ science organisation.
 - Will be calls for applicants every two years once sufficient funds are available.

Move that the treasurer's annual financial report as circulated be accepted as an accurate record of the Society's accounts.

Moved: Vicki Burggraaf, Seconded: John Booker. Carried.

Move that the annual subscriptions for 2013-14 remain at \$85 for full members, \$42.50 for student and retired members and US\$85 for overseas members outside Australia.

Moved: Vicki Burggraaf, Seconded: Paul Kenyon. Carried.

Move that the AGM give leave to the Management Committee appoints Auditors for the 2013 Society accounts.

Moved: Vicki Burggraaf, Seconded: Sarah Pain. Carried.

Publication manager's report

Presented by Paul Kenyon and Penny Back

- Acknowledge Neville Jopson for writing CDs and linking to online format, and updating on SciQuest.
- New Occasional publication. Welfare book. At printers. Will be on sale for \$50.
- Future Occasional publication:
 - Pastoral-based Farming Systems book. This OP will consider how to manage stock under pasture grazing – more about systems and less about science. Has been developed after suggestion of Jock MacMillan at 2012 Landcorp Lecture. Has support from both Massey and Lincoln University as a teaching resource. Question: should pig and poultry be included?
 - Requesting leave from the Society for the committee to call on members to be authors
 - Alistair Nicol as Editor
- There will be a stock take of OPs on-hand to see where we are at.
- Update of Meat Production and Processing OP – Nicola Schreurs to investigate.
- Consider the opportunity to write a wool science book. Knowledge of wool science is still present in the Society and there is a good opportunity to get that knowledge into a book.

Move that the Publication manager's report be accepted.

Moved: Penny Back, Seconded: Nicola Schreurs. Carried.

Election of officers (2013-2014)

Nominations for the following positions were received:

- | | |
|------------------------|---|
| • Past-president | Paul Kenyon (Massey University) |
| • President | David Pacheco (AgResearch) |
| • Vice President | Grant Edwards (Lincoln University) |
| • Treasurer | Thomas Lopdell (LIC) |
| • Secretary | Nicola Schreurs (Massey University) |
| • Newsletter | Chris Logan (Lincoln University) |
| • Publications | Paul Kenyon (Massey University) |
| • Website Manager | Rebecca Hickson (Massey University) |
| • Conference Organiser | Steve Morris/Penny Back (Massey University) |
| • Co-opted member | John Booker (farmer liaison). |
| • Executive Secretary | Kate Crookston |

- Proceedings Editor

Sam Peterson/Catriona Jenkinson

President, Paul Kenyon called for any last minute nominations from the floor, and none being put forward, called for the nomination for officers to be closed.

There being only one nomination for each position, the nominated persons were declared elected. Carried by acclamation.

2014 Conference

- 2014 Conference - Palmerston North/Massey University rotation.
- Co-chairs of the conference organising committee are: Steve Morris and Penny Back
- Pencilled in for being in Wellington. Idea of holding conference in Wellington is that Wellington is easier to get to and potentially could have a Policy session.
- Intended to hold conference in first week of July: i.e., 1-3 July 2014.
- Once we have abstracts will know if it will be a two or three day conference
- Called for initial comments from the floor - none

General business

- Young members. Declining applications and the Society needs to consider ideas for increasing Young Member Award applications
 - Society should consider using some of the travel award funds to fund those successful applicants to attend the conference to present at the conference. Approx \$500.
 - Why is the drop occurring? Is it because the cost to attend the conference is prohibitive. Or, is it because young members prefer the brief communication option to allow publication as journal paper – and journal papers perceived as more important for career development.
 - Early November abstract submission could be too early for those students at Universities. Committee is going to consider an early December submission date
 - At this stage not looking to change from full paper format for Young Member's award. Judging criteria based on a full paper already set in place.

Move that the committee is allowed to fund up to 6 young members at \$500 to cover travel costs associated with attending the Society's conference.

Moved: Paul Kenyon, Seconded: Penny Back. Carried.

Meeting adjourned at 18:10 h until the conference dinner

Meeting reconvened at 19:20 h on 3rd July 2013 at the Conference Dinner, Awards Ceremony at the Vilagrad Vineyard, 702 Rukuhia Road, RD2 Ohaupo.

Awards

- Geoff Nicoll gave a presentation as part of his Life Member Award. And Neveille Jopson presented as part of McMeekan Memorial Award. Was suggested that Geoff

Nicoll and Neville Grace manage a contract session on CT scanning at 2014 conference.

- Thanks was given to Roland and Rell Sumner for their efforts in editing the Proceedings over the (many) previous years.
- Young Member award sponsored by DairyNZ
- 2013 Awards:
 - University Jubilee Award: Lisa Lewis (Lincoln), Farrah McLean (Massey)
 - Young Member Award: Nicola Law
 - Innovation Award: Not awarded
 - McMeekan Memorial Award: Neville Jopson
 - Sir Arthur Ward Award: Not awarded
 - Life Member: Geoff Nicoll
 - Living Legend: Dave Clark
 - Landcorp Farming Ltd Lecture: Ian Clarke

Meeting closed at 21.15 h. 3rd July 2013

NOMINATIONS FOR MANAGEMENT COMMITTEE 2013-2014

Nominations for committee members are requested by April 30, to the Executive Secretary. The nominee, nominator and seconder must be members of the Society. The committee will be elected by postal ballot with the result announced at the Annual General Meeting, except that the Vice-President automatically becomes President, and the current President automatically becomes Immediate Past President.

The management committee consists of the following:

President	Vice-President
Immediate Past-President	Secretary
Convenor of the Conference Organising Committee	Publications Manager
Treasurer	Website Manager
Editor of Proceedings	Newsletter Manager

All offices except the President and Immediate Past-President are open for election. Presently the committee meets three times a year, immediately before and after the Annual Conference and once in December to evaluate abstracts of papers submitted for presentation at the next conference. In addition to that it holds two or three telephone conference calls each year. To understand how the various officers contribute to the strategy and operations of the Society, speak to current and past committee members.

TO NOMINATE SOMEBODY FOR A POSITION ON NZSAP MANAGEMENT COMMITTEE, PLEASE SEND THE FOLLOWING TO THE EXECUTIVE SECRETARY, KATE CROOKSTON: P.O Box 955, Cambridge 3450, NEW ZEALAND email: nzsap.inc@gmail.com

- Position
- Name of Nominee (Printed) and signature of Nominee
- Proposer (Print name) and Proposer's signature

- Seconder (Print name) and signature of Seconder
 - Date
-

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To reduce demand for paper and therefore drive down the international carbon price, we are now offering you the opportunity to receive a nice crisp PDF of our newsletter delivered to your Inbox!

If you'd prefer to get your newsletter the modern way – just email Kate Crookston, Executive Secretary at nzsap.inc@gmail.com and she will make it so.

NZSAP ANIMAL SCIENCE TRAVEL AWARD

Dr. McCoard's travel to the ISEP Symposium, NDSU and University of Illinois

In September 2013, Sue McCoard from AgResearch Grasslands attended the 4th International Symposium on Energy and Protein Metabolism and Nutrition (ISEP) in Sacramento, California, USA, supported by the New Zealand Society of Animal Production and Trimble Foundation. Prior to the Symposium, Sue also visited the University of Illinois (hosted by Assoc. Prof. Juan Loor), and North Dakota State University (hosted by Assoc. Prof. Kim Vonnahme) to explore collaborative opportunities in the area of nutrition and physiology research.

The Symposium was attended by 235 delegates from 23 countries and brought together researchers from diverse fields related to livestock production science. The presentations included 7 invited presentations, 117 offered papers and 120 posters. Dr McCoard gave an oral presentation entitled 'Parenteral administration of twin-bearing ewes with L-Arginine enhances birth weight and peri-renal fat stores of female offspring in sheep' in the "Tissue Metabolism" session of the meeting. The impact of nutrients on tissue growth and development is a growing area of research in livestock species, particularly in relation to the potential impact on livestock production efficiency. There were several presentations at the meeting related to this research area, and the forum provided ample opportunity for discussion between scientists with similar research interests.

Nutrition and metabolism and of biodiversity loss and environmental sustainability were key themes at the Symposium. Improving production efficiency rather than productivity per se were key messages, with nutritional interventions being a primary focus area, including early in life which. Other focus areas included the potential to increase gains by decreasing the non-productive periods of an animal and nitrogen use efficiency.

The Symposium also featured tour options. During the UC Davis "fruits and nuts" tour, Dr McCoard visited the joint University of California, Davis – USDA Agricultural Research Service Germplasm Repository (locally referred to as the Wolfskill Unit) near Winters. This is the home of the world's largest germplasm repository for fruit and nut species. We had unlimited opportunity to sample the many varieties of grapes and citrus fruits, as well as sampling local nuts and wines under the shade of the 100+ year-old olive trees which was a welcome retreat from the 40+ degree heat.

The structure of the Symposium provided ample opportunity for interaction between delegates with a buffet breakfast each morning in conjunction with poster sessions. Conference lunches and evening receptions/dinners provided further opportunity for interaction. Co-location of the Symposium with conference accommodation at the Sheraton Hotel made it easy for delegates to interact.

In addition to the Symposium, Dr McCoard also visited the University of Illinois (hosted by Dr Juan Loor) and North Dakota State University (hosted by Associate Professor Kim Vonnahme) to scope research collaboration opportunities. Dr McCoard gave an invited presentation to faculty and students at both Universities and met with many post-graduate students and faculty members in addition to touring the labs and sheep, beef and dairy research facilities. Collaborative opportunities were identified including the potential to share students and technology platforms, and specific project opportunities are being developed.

NZSAP ANIMAL SCIENCE TRAVEL AWARD

Shona Pryor

The NZSAP Animal Science Award supported my attendance at the American Dairy Science Association (ADSA) and American Society of Animal Science (ASAS) joint annual meeting held on 8-12 July 2013 in Indianapolis, Indiana, USA. This meeting involved approximately 3,000 animal and dairy scientists from around the world and a diverse scientific program with an array of 2,200 poster and oral presentations.

During the second lactation biology session of the meeting I presented some of my post-doctoral research entitled "The effect of induced involution on DNA methylation upstream of milk protein genes, α -lactalbumin and β -lactoglobulin". My research highlights an epigenetic mechanism that is associated with decreased expression of milk proteins with the shut-down of lactation in dairy cows. This research is part of a wider programme that may lead to an understanding of the mechanisms within the mammary gland that regulate milk production and how the mechanisms may be influenced by different environmental factors.

Some of the most interesting highlights that I noted from the programme included: the effect of offspring gender on milk production in dairy cows and the use of technologies such as infra-red thermography and ultrasound scanning for the research of intramammary infections and the developing mammary gland. Also, a recurring theme in the lactation biology sessions appeared to be the effect of circadian rhythm and mammary clock regulation on milk production. I also attended a session entitled "Contemporary and emerging issues", which included a fascinating range of presentations from the role of human resource management on dairy farms through to bioinformatics pipelines and fermentation in large-scale biogas power plants. In addition to the scientific programme, attendance at this conference provided many networking occasions and allowed opportunities to build and develop relationships with potential collaborators.

I would like to thank the NZSAP for their financial support, which allowed me the opportunity to attend this stimulating and enjoyable international conference.

NZSAP ANIMAL SCIENCE TRAVEL AWARD

Martyn Donnison, AgResearch Ruakura Research Centre

The majority of presentations throughout the conference focused on prenatal diagnoses and genetic testing using advanced technologies such as Microarray based Comparative Genomic Hybridization (CGH), Next Generation Sequencing (NGS) and target enrichment by Hybrid Capture. These developments have assisted 'healthy' embryo IVP considerably. Noticeably, the physical sampling remains unchanged; either polar body removal or embryo biopsy is employed and equally, the greatest controversy exists in this area. It is generally accepted that errors are introduced during sampling and that single sampling alone cannot accurately determine the extent of genetic abnormalities within an embryo. The plenary session reported on clinical and to a much lesser extent, research derived data, and was of most interest.

In early embryos the first cell-fate decision segregates two cell populations: the outer trophoblast (TE) and inner cell mass (ICM). Cells are primarily directed to the ICM in two waves of asymmetric division at the 8-16-cell and 16-32-cell stage transition. The ICM then diverges to become epiblast (EPI) which will generate the embryo/fetus and extra-embryonic primitive endoderm (PE). Recent datasets suggest the proportion of cells internalized in the two waves impacts greatly upon cell fate eg. cells internalized in the first wave contribute to EPI whereas second wave cells contribute to PE however, when the majority of ICM is derived from only the first wave, both EPI and PE must therefore differentiate from only these available cells.

Molecularly, the internal asymmetric expression of the homeobox transcription factor Cdx2 appears to correlate or contribute to cell polarization. Cells of an eight cell embryo express Cdx2 nearer the outside of the cell. Subsequent expression then correlates to the plane of cellular division; low Cdx2 results in asymmetric division (one internal and one external daughter cell) whereas high expression results in symmetric division (two external daughter cells). The 97bp 3' end of the Cdx2 open reading frame (ORF) is implicated in this polarizing effect. Also, high Cdx2 expression in internal cells is seen to be associated with increased cell death.

Some embryo selection procedures focus on the nuclear component of the embryo, such as evaluation of pronuclear morphology, preimplantation genetic diagnosis and preimplantation genetic screening. Others concentrate on the cytoplasmic component, analyzing the quality of embryo metabolism, the cytoskeleton or homeostatic mechanisms. It is generally regarded that ultimately, selection should be a combination of several approaches. Combining genetic testing of the polar body(s) and examination of the cytoplasmic flows is promising, as it provides information about embryo quality within several hours after fertilization, and, therefore, significantly hastens the selection process.

More non-invasive approaches to determining embryonic or oocyte health are of course, viewed favorably. Assessment using time-lapse microscopy and evolution of morphokinetic parameters apparently identifies aneuploidy by resultant changes in cell cycling. Cumulus cells are an alternative source of investigation. Sampled at oocyte retrieval, these allow an assessment of the oocyte health pre-fertilisation, the oocyte being a significant contributor to aneuploidy in the resulting embryo, particularly in aged maternal partners.

NZSAP ANIMAL SCIENCE TRAVEL AWARD

Kuljeet Singh, February 2014

The NZSAP travel award allowed me to attend and give two presentations at the 8th World Congress on Developmental Origins of Health and Disease, Suntec City, Singapore (17-20 November 2013).

This conference focused on the impact of early life nutrition and other environmental factors on life-long health and disease. There were sessions of relevance to animal science research including: agricultural applications, intergenerational factors and inheritance, epigenetics, animal models of programming, programming of immune function and reproductive function, microbiome and undernutrition. I presented one abstract in the "Intergenerational factors and inheritance" session and one in the "Agricultural applications" session. These presentations highlighted the identification of mammary gland microRNAs and regulation of milk production, as well as our investigation of possible transgenerational maternal effects for regulation of milk production. This conference was an excellent opportunity to learn about new technologies and methods for investigating early life events and the impact on life-time productivity, and to show-case the significant role New Zealand science plays in agricultural research. Following the conference, we plan to strengthen collaboration with internationally and nationally recognised epigenetic and molecular scientists from University of Southampton and Auckland University, respectively. This will greatly advance our understanding of the molecular mechanisms regulating milk production of the dairy cow. Ultimately this will result in the development of novel strategies and/or intervention technologies for increasing life time productivity. This will benefit New Zealand through increased profitability of our dairy industry.

NZSAP ANIMAL SCIENCE TRAVEL AWARD

Nicola Priest

The NZSAP Animal Science Travel award supported my attendance at the Australasian Dairy Science Symposium from the 13-14th of November in Melbourne Australia. The purpose for my attendance was to present my paper entitled "Treatment of subclinical endometritis in dairy cows with a non-steroidal anti-inflammatory drug". This conference covered a wide range of dairy related topics including biotechnology in dairying, evaluation of different dairy production systems, and various animal and pasture related topics.

The two presentations that I thought were especially relevant to the New Zealand dairy farmer, and my area of research, were the papers presented by Juan Looor and Marina Von Keyserlingk. Both speakers stated that there is something happening pre-calving, perhaps some sort of subclinical illness that has not yet been identified, that is reducing the immune capacity in a subset of cows. This reduction in immune capacity results in these cows contracting diseases post-calving, e.g. metritis, which leads to reduced milk production and reproductive performance.

Juan reported that disease post-calving was associated with reduced liver function and the presence of systemic inflammation pre-calving. This is in line with the results that the reproduction group at

DairyNZ have obtained when investigating the uterine disease subclinical endometritis. Marina reported that these animals that go on to have some sort of illness after calving display changes in feeding behaviour, social behaviour, and resting behaviour around parturition. Marina concluded that it monitoring of behaviour prior to calving will facilitate the identification of cows that are at risk of becoming ill after calving, facilitate prompt treatment, and aid in informing management decisions to prevent disease in the future. Although monitoring cow behaviour in a pasture-based system may not be entirely practical, Juan's group has investigated the use of biological markers (e.g. NEFA for energy balance) and molecular technologies to assess a cow's physiological state (healthy/unhealthy) and welfare. The use of a combination of these two approaches will allow for greater understanding of how and why this subset of cows are at risk of disease, aid in the identification of these cows, and help to develop strategies to mitigate this condition.

The conclusion that I draw from these two papers is that the prevention of disease post-calving starts with prevention of inflammation and improvement of liver function pre-calving. Thus, more research needs to be done to elucidate the cause of this liver dysfunction and inflammation pre-calving so that management strategies can be developed to improve cow health, performance, and welfare on New Zealand Dairy farms.

NZSAP ANIMAL SCIENCE TRAVEL AWARD

Kristina Mandok

In 2012, I was granted the NZSAP Animal Science Travel award to attend the Australasian Dairy Science Symposium (13-14th November) in Melbourne. The conference covered a range of topics including: Biotechnology in dairying (animals and plants), dairy production systems, animals (including health, welfare, and reproduction), and feedbase and nutrition. I also presented a paper entitled "The efficiency with which metabolisable energy is used for live weight gain differs between feed".

The presentation I enjoyed the most was Marina von Keyserlingk's talk on utilising behavioural changes of dairy cows to identify animals in the periparturient period that are "at-risk" of becoming sick. During this period, there are many changes for the animal, including physiological, metabolic, and physical adjustments and new environmental challenges. Ill-health during this time is not uncommon, despite research-based management tools available to minimise their incidence. Marina von Keyserlingk discussed the fact that cows show changes in behaviour associated with future illness, before clinical symptoms are apparent. This behaviour is called "sickness-behaviour", and can be used for early illness-detection or identification of "at-risk" cows, and consequently for intervention using appropriate management strategies. These behavioural changes include reduction in feeding time, feed intake and activity, and reluctance or inability to compete for feed or lying space (when held indoors). Particularly interesting was the reasoning behind those behavioural changes, e.g. the idea that cows reduce their intake (for example) to reduce the intake of micronutrients such as zinc or iron, which are needed to support pathogen growth. Indirectly, this reduction in dry matter intake facilitates recovery by reducing pathogens in the body. Monitoring behaviour to detect illnesses before clinical symptoms appear is an interesting approach; however, in pasture-based feeding systems as found in New Zealand, this could prove difficult, as intake observation (for example) is not easily possible. Devices such as pedometers or munch-meters already exist and are used extensively in research. It could be worth investigating the efficacy of using these devices on farm in this context. In a similar vein Mairi Stewart's talk explored infrared thermography (IRT) in early disease detection. This technology measures radiated electromagnetic energy and can detect even small changes in the eye temperature of an animal. As body temperature changes can be associated with stress or illness, IRT could be a non-invasive way to detect illness early. Intervention could then be before the onset of clinical signs, thereby minimising discomfort for the animal and costs for the farmer. In her talk Mairi Stuart reported on research in beef cattle feedlots in Canada, where this technology was used to successfully identify bovine viral diarrhoea and bovine respiratory disease, as well as research in dairy cows, where thermography was used for early mastitis and lameness detection. The practicality of this technology in the NZ pasture-based farming system has yet to be investigated; however, there could be the possibility to add IRT to already existing technology in the milking shed.

NZSAP Animal Science Award Travel Report

Edith Khaembah

Science Award supported my travel to attend the Animal Science Modellers' Group Meeting (7 July 2013) and the 2013 Joint Annual meeting of the American Dairy Science Association® - American Society of Animal Science (JAM 2013; 8-12 July 2013) held in Indianapolis, Indiana, USA.

The one-day Animal Science Modellers' Meeting was attended by 41 delegates and 10 oral presentations were given. The JAM 2013 was attended by over 3000 delegates and had more than 2100 abstracts and 30 symposia. Both meetings brought together researchers and students and provided opportunities for networking and for sharing experiences in animal and plant research. Posters and symposia were scheduled around a wide range of topics and included sessions on companion animals. There were also sessions on teaching and learning in animal science for graduate and undergraduate students.

There were numerous opportunities to share information across disciplines, animal species and pasture species. I was particularly drawn to the symposium on 'forages systems adaptable to dry conditions' to learn more about what is happening on the research front to buffer or increase resilience of agricultural systems from the impacts of climate change. At the time of JAM 2013, New Zealand agricultural production had just experienced a drought and was still suffering from the devastating after-effects. The presentations (all based on US research) highlighted development of drought tolerant pastures and forages as a high priority research objective. Presentations included a review of current climatic trends, research findings in maize and sorghum and current research employing genomics approach to improving drought tolerance in forage crops.

The current climatic conditions indicate an increase temperature and higher frequencies and severity of droughts in the future. I gathered from the symposium that development of pastures/forages for water-limited environments is an issue of global research interest. From the production viewpoint, it is crucial that pastures/forages bred for drought tolerance should also have the ability to produce high yields. Genomic tools offer the means to identify potential markers for drought tolerance which can aid in screening and improvement of drought tolerance in pastures and forages. Compared to conventional approaches, marker-assisted breeding is simpler, more efficient and faster.

NZSAP Animal Science Award Travel Report

Augustin Rius

The primary aim of my travel was to attend and present a paper at the 11th International Symposium on Biology of Lactation in Farm Animals (BOLFA) and the 63th Annual Conferences of the European Association of Animal Production (EAAP) that took place in Bratislava, Slovakia. The secondary objective of my trip was to visit, disseminate, and discuss research outcomes of my investigations with researchers and students in INRA-Rennes and INRA-Clermont-Ferrand, France. This travel was funded by NZSAP Science Award and DairyNZ. Without this support this travel would have not been possible.

The BOLFA meeting takes place every 2 years and it was previously held in Greece in conjunction with the EAAP 2010 annual conference. BOLFA meeting brings together expertise in disciplines such as lactation physiology and biology (mammogenesis, lactogenesis and galactopoiesis). The title of my presentation was "Effect of Milking Frequency and Nutrition in Pasture-based Dairy Cows During an Extended Lactation"

The EAAP conference takes place every year in a country member of the EU. This conference brings together expertise within a wide range of disciplines including farm systems, pasture-based animal production systems, digestion, absorption and metabolism of nutrients, endocrinology, reproduction, animal welfare, animal behaviour, and genetics. The majority of the papers covered research conducted in bovine and small ruminants although a small number of papers covered other industries such as swine, poultry, equine, buffalo, and mink.

The general theme of the 63th Annual Meeting of EAAP was 'Sustainability and efficiency of the livestock sector' which was very relevant to the New Zealand dairy industry. The EAAP 2012 had 93 sessions held over 4 days. The numbers of seminars according to these areas are given below. Animal genetics (10), animal nutrition (6), animal management and health (10), animal physiology (8), livestock farming systems (7), cattle production (20), sheep and goat production (14), pig production (10) and horse production (8).

In addition, I visited INRA (research units located in Rennes and Clermont-Ferrand) to learn more about their research priorities and facilities. The title of my seminar was "Challenges for the Dairy

Industry and Research Priorities for New Zealand". My visit to INRA offered opportunities for future collaboration in areas relevant for dairy industries of NZ and France.

I gained a great deal of knowledge during the BOLFA and EAAP meetings and there were many opportunities to learn more from European research institutes and programs. This will enable us to either avoid research duplication or to run our own studies using New Zealand cows and pasture-based system. After my presentation I was approached by the Danish group (Aarhus University) as they had some interesting comments. They have just started a research program which is fairly similar to ours with similar research queries and hypotheses.

NZSAP AgResearch Animal Genomics International Travel Award Press Release

Milica Ciric

The NZSAP AgResearch Animal Genomics International Travel Award supported my attendance at the 8th Annual DOE Joint Genome Institute Genomics of Energy & Environment Meeting in the USA in March this year. The meeting was organised by the Joint Genome Institute (JGI) and all functions were held at the Marriott Hotel in Walnut Creek, California. Walnut Creek, a quiet little city in the San Francisco Bay area, is not only home to the headquarters of the DOE's sequencing giant JGI, but also part of a highly intellectually stimulating neighbourhood, including Lawrence Berkeley and Lawrence Livermore National Laboratories, UC Berkeley and California Academy of Sciences, to name a few.

The meeting was very diverse and fast paced, with the main focus on applying genome sciences and technologies to address bioenergy and environmental issues. In four days, this meeting offered high quality invited presentations, two nights of poster sessions, as well as a very interesting guided tour through the JGI sequencing facilities, and workshops on sequence-based bioinformatics, data management systems and new sequencing technologies. The organizers achieved good balance between the presentation of novel metagenomic research and informing scientific users on recent breakthroughs both in sequencing technologies and information processing through talks and workshops.

The talks covered four main areas: metagenomics, plant and microbial genomics and synthetic biology. The meeting had strong focus on the metagenomics of microbial communities involved in lignocellulose degradation; metabolic engineering efforts in plants, fungi and microorganisms for improvement of biofuel feedstocks; synthetic biology and single cell genomics. Keynotes presentations on synthetic biology, delivered by Chris Voigt from MIT and on the Tara Oceans project by Eric Karsenti from *EMBL* were of outstanding quality.

I presented a poster on part of my PhD project I am conducting at AgResearch in collaboration with Institute of Fundamental Sciences at Massey University in Palmerston North. The focus of my PhD project is developing a metasecretome phage display approach to explore the bovine rumen plant-adherent microbial metagenome for lignocellulolytic activities. Rumen plant-adherent microbial communities have key roles in the degradation of lignocellulosic material for the provision of energy to their hosts. Fibrolytic activity, the most prominent feature of the rumen microbiome, depends on efficient adherence of rumen microbes and their fibrolytic enzymes to feed material. This is mediated *via* cell surface and secreted proteins, collectively referred to as the metasecretome. Consequently, the rumen microbial metasecretome is predicted to represent a valuable repository of lignocellulolytic bioactivities. In order to develop a metasecretome phage display approach on a large "meta" scale I have combined next generation sequencing and phage display technologies and applied it to select, express and display secretome proteins from the bovine rumen plant-adherent microbial community. In my poster, I presented data on the development of this method and results of *in silico* mining of the metasecretome-enriched phage display library for lignocellulolytic activities. The finding that attracted the most interest was prominent enrichment of cohesin and dockerin components of the cellulosomes, large cell-surface bound cellulose-degrading multi-enzyme complexes that have been rarely detected in previously published rumen metagenomic studies. Discussing my results with scientists from different metagenomic and bioinformatics backgrounds was very helpful for gaining novel perspectives on my research.

Overall, the JGI conference has been highly informative and enjoyable, and provided invaluable experience for my development as a scientist. The quality of research presented was impressive and the conference provided very friendly setting for networking and learning. I would like to thank NZSAP for supporting me with the travel award.

MANAGEMENT COMMITTEE

		Phone	Fax	Email	Location
PRESIDENT	David Pacheco	06 351 8232	06 351 8003	david.pacheco@agresearch.co.nz	AgResearch Grasslands
VICE-PRESIDENT	Grant Edwards	03 423-0660		Grant.Edwards@lincoln.ac.nz	Lincoln University
Past-PRESIDENT	Paul Kenyon	06 356 9099	06 350 5636	P.R.Kenyon@massey.ac.nz	Massey University
TREASURER	Thomas Lopdell	07 856-0518		tlopdell@lic.co.nz	LIC Hamilton
SECRETARY	Nicola Schreurs	06 356 9099		N.M.Schreurs@massey.ac.nz	Massey University
NEWSLETTER	Chris Logan	03 423-0670		Chris.Logan@lincoln.ac.nz	Lincoln University
PUBLICATIONS	Paul Kenyon	06 356 9099	06 350 5636	P.R.Kenyon@massey.ac.nz	Massey University
CONFERENCE	Steve Morris	06 356 9099	06 350 5636	S.T.Morris@massey.ac.nz	Massey University
CONFERENCE	Penny Back	06 356 9099		p.i.back@massey.ac.nz	Massey University
WEB SITE	Rebecca Hickson	06 356 9099		r.hickson@massey.ac.nz	Massey University
S.I FARMER REP	John Booker	03 314 4129 (day)		j.booker@amuri.net	Nth Canterbury
EXEC. SEC.	Kate Crookston	07 823 9345		nzsap.inc@gmail.com	

An electronic version of this newsletter and other information on the Society is available at:
www.nzsap.org.nz

Any contributions to the Newsletter should be forwarded to: Chris Logan, Lincoln University, AGLS Faculty, PO Box 84, Lincoln University 7647. Email:
Chris.Logan@lincoln.ac.nz

Return Mail Address:

Kate Crookston
 Executive Secretary
 New Zealand Society of Animal Production
 P.O Box 955
 Cambridge 3450
 NEW ZEALAND

