MASS PET STERILISATION PILOT PROJECT
SA WINE WOWS CHINA FARE kicks off
Pet overpopulation and the resulting neglect and disease transmission risk was identified as a serious problem in the Western Cape. To combat this, the Western Cape Department of Agriculture (WCDOA) teamed up with the Stellenbosch Local Municipality, several animal welfare organisations and veterinarians and began a pet mass sterilisation pilot project in Kayamandi, Stellenbosch.
This issue contains some information on our scientists and other technical staff that attend international conferences and workshops. This provides the opportunity to reflect on the relevance of attending these events.

Firstly, the attendance of these events provides the opportunity for staff to meet international experts, have discussions with them and learn from their vast experience and knowledge. The opportunities for networking with world renowned scientists, researchers and technical people allow our staff to build networks and relationships with these people that can be very valuable for the work this department does in the future. Many links established over the years with international experts are still maintained today and continue to provide valuable information that assist staff in their research and applied research endeavors.

Secondly, the papers and posters by our staff provide the opportunity for them to present their work to other experts that would normally not be aware of their efforts. It also allows them to receive comments and suggestions on their work. It creates the opportunity for peer review, which would not happen if they did not attend the international conferences and workshops. This is a mutually beneficial opportunity for all attendees of these events.

Thirdly, the international recognition that staff members receive for their work, as expressed in the invitations to present papers and posters at international congresses, reflects the high esteem for the work and the perceived value of sharing the information with other international scientists and technical people. It therefore results not only in the recognition of the work that the specific person has done, but also promotes the Department as a centre of excellence in terms of international norms and standards.

Fourthly, these visits also serve to introduce young scientists and technical staff to the world of international science and motivates them to reach similar levels of knowledge and recognition as the international experts that they listen to and have the opportunity to meet. It hopefully also motivates them to continue with their own careers with the Department, utilising the excellent opportunities provided within the Department and their normal day to day work activities.

It is a requirement that a formal report must be compiled after every international visit and these reports are available in the library for all staff to read and to benefit from the contents thereof.

It can be concluded that the money spent on attending international congresses, symposia and workshops is money well spent and the benefit for both the Department and the officials, far exceeds the monetary value of the attendance.

Happy reading!

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**Gerriert Van Rensburg** intronised as a **Commandeur du Vin de Bordeaux en Afrique du Sud**

Wouter Kriel – wouter.kriel@westerncape.gov.za

Gerrit van Rensburg, Western Cape Minister of Agriculture and Rural Development, was intronised as a Commandeur du Vin de Bordeaux en Afrique du Sud at a function held on Vergelegen Farm, Somerset West.

The Comanderie de Bordeaux en Afrique du Sud acknowledged Minister van Rensburg for his contribution in promoting the South African wine industry in general, and specifically for his efforts in relation to the Western Cape Burgundy Exchange Programme.

Minister van Rensburg said he is honoured by the recognition on this level. “The wine industry is a historic cornerstone of the Western Cape economy, and today it provides more than 275 000 job opportunities throughout a complex value chain”. He said the South African wine industry is competing successfully on the international wine market, and we have gained a worldwide reputation for our quality products.

Minister van Rensburg said the relationship with the French wine industry is of utmost importance for both countries, as we have a lot to learn from one another. He said the Western Cape Burgundy Exchange Programme is exposing our wine industry workers to international practices, and the skills and knowledge gained while in France is of much value to our local industry.

The Burgundy Exchange Programme was initiated in 2000, and includes study programmes for cellar students and cheese makers, cultural exchange programmes and economic development initiatives.

The Western Cape Department of Agriculture invests R1 million annually in the Exchange Programme, allowing for between 20 and 30 Western Cape workers in the agricultural and related sectors to hone their skills in France each year. Approximately 500 people from the Western Cape and Burgundy have benefited from this programme since its inception.
The Western Cape Government, together with Wines of South Africa, recently hosted the second Beijing Wine Tasting in China. This year saw 16 wine companies exhibiting more than 250 South African wines. The event was attended by Chinese wine importers, the Chinese wine press, and local wine enthusiasts. Gerrit van Rensburg, Western Cape Minister of Agriculture and Rural Development, opened the event, inviting the Chinese audience to experience the Western Cape through wine tourism.

Minister van Rensburg and Michaela Stander, Market Manager: Europe and Asia, Wines of South Africa, fielded questions from the Chinese press at a press briefing.

Minister van Rensburg told journalists South Africa produces the best quality wine in the world at any given price point. He said South Africa is unique amongst wine producing countries due to our ability to guarantee the origin of each bottle of wine back to the vineyard where the grapes were harvested. “This is a very strong guarantee of quality and food safety, unmatched by the rest of the wine producing world.”

Michaela Stander stressed the diverse wine offering from the Western Cape: “We have some of the oldest viticultural soils in the world. Our winelands are encircled by two oceans and we have diversity of soil and climate, giving our winemakers endless wine-making possibilities. We are able to produce a variety of wine styles all representing incredible value at each price point. Stylistically we produce varietal, fruit forward wines with the elegance and finesse that makes it easy to pair with food. In terms of matching with Chinese food, we have found that especially our Chenin Blanc and Pinotage complement some of the dishes.”

INTERESTING FACTS ABOUT THE SA WINE INDUSTRY

• South Africa produces roughly 800 million litres of wine per year, of which approximately 50% is exported. In terms of global production SA is the 8th largest producer with approximately 102,000 hectares under vineyard. South Africa represents 3% of global wine trade in terms of volume and 6% in terms of value.

• Our largest export markets are the UK, Germany, Sweden and the Netherlands with the USA and China becoming increasingly important. China currently represents approximately 3% of our total exports. SA currently has less than 3% market share in China, which represents an excellent opportunity for future export growth.

• South African wine exports to China have experienced good growth in both bulk and packaged product, growing approximately 32% over the past 4 years (2009 – 2012). Since 2011 China entered our list of our top ten export destinations for packaged wine exports. Figures for the first five months of 2013 already show a 53% increase for total exports, compared to the same period last year. What is especially important is that the growth has been predominantly in packaged exports, which showed a 40% increase over the same period.

Gerrit van Rensburg – gerrit.vanrensburg@westerncape.gov.za
Michaela Stander – michaela.stander@westerncape.gov.za

Photo by Wouter Kriel
Gerrit van Rensburg, Western Cape Minister of Agriculture and Rural Development, and Michaela Stander, Market Manager: Europe and Asia, Wines of South Africa, field questions during a press briefing at the recent Beijing Wine Tasting.
DE-WORMING SUPPLIES FOR CART HORSES DONATED

Wouter Kriel – wouter.kriel@westerncape.gov.za

Minister van Rensburg thanked the cart horse owners present for the manner in which they, in cooperation with the various animal welfare organisations, cared for their horses. Minister van Rensburg said cart horses are part of Cape Town’s culture and history, and it is important to keep them integrated in the City’s economy.

It is estimated that the 1800 de-worming kits will be sufficient for the wellbeing of 800 horses for one year.

Photo by Wouter Kriel
From left to right: Diana Truter, Cart Horse Association; Gerrit van Rensburg, Western Cape Minister of Agriculture and Rural Development; Clive Matthews, Cape of Good Hope SPCA

WORLD ENVIRONMENTAL DAY 2013

Douglas Chitepo – douglasc@elsenburg.com

Agriculture - A PILLAR of Food Security as part of the World Environmental Day Celebrations - Ithemba Labantu Green Community Centre in Phillipi

As the lead department in this initiative the Western Cape Department of Agriculture, in partnership with the Department of Environmental Affairs and Development Planning, co-hosted an event at the Ithemba Labantu Green Community Centre in Phillipi, in support of the food security project initiatives undertaken by this non-profit organisation.

The theme of the event was Think, Eat and Save with the view of creating awareness in the community about food wastage, but at the same time to encourage the community to become active citizens of their own food production systems, such as food gardens, in order to promote food security and livelihoods.

The department through the Programme Farmer Support and Development, provided assistance and much needed production inputs to four households of the area who currently have plots. Each of these households received seedlings, forks, spades, compost, rakes etc. This was well received by the beneficiaries and an acknowledgement of gratitude and appreciation was given by the Head of Ithemba Labantu Centre.

Various guest speakers participated in the event, such as representatives from Woolworths and the Department of Social Development, who had a common message that WE ALL HAVE TO LOOK AT SUSTAINABLE FOOD PRACTICES IN BALANCE WITH NATURE.
The usual farm sounds were accompanied by the enthusiastic voices of Grade R pupils singing “Baa Baa Black Sheep” and “Mary had a little lamb” at this year's Elsenburg School Open Days.
The School Open Days are an annual event held in March every year and is organised and hosted by the technicians of the Directorate Animal Sciences, Programme: Research and Technology Development Services, in collaboration with Communication Services. Schools from Stellenbosch, Paarl and Strand were invited to attend this year’s event.

Almost 400 Grade R learners attended the two-day event at the Dairy Section at Elsenburg. The purpose of the event is to offer learners from the town and city the opportunity to observe a working farm and learn about farm animals.

The technicians of Animal Sciences had the honour of interacting with teaching the children about agriculture. The learners had the opportunity to see, often for the first time, live sheep, chickens, ostriches, cows, fish, goats, pigs and horses. They saw a demonstration of a cow being milked, handled a 5-day old lamb and learned what products are derived from the different farm animals. The information is part of their school curriculum. The animals shown to the children are resources of the Department of Agriculture at Elsenburg and Kromme Rhee, with some animals sourced from Stellenbosch University’s Mariendahl Research Farm.

The organising team is looking forward to offering learners another educational experience at next year’s event. Readers with children starting Grade R or Grade 4 next year can request more information from Ellrico Pietersen at ellricop@elsenburg.com, about inviting schools to participate in March 2014.
Western Cape Government SUPPORTS WINEMAKERS at YANTAI International Wine Exposition

Wouter Kriel – wouter.kriel@westerncape.gov.za

The Western Cape Government in partnership with Wines of South Africa supported 16 South African wine exhibitors at the Yantai International Wine Exposition held from 5 - 7 July. Yantai is the third largest city in the Shandong Province, with which the Western Cape is celebrating 15 years of bilateral cooperation as sister provinces. This is the third year the Western Cape Government has supported exhibitors for this exhibition.

Minister Winde said wine exports to China are opening doors for other sectors of the Western Cape economy. He said tourism in the Western Cape is closely linked to the wine industry. South African wine exports to China have experienced good growth in both bulk and packaged product, growing at approximately 32% over the past four years (2009-2012) in terms of total exports, while packaged exports grew by 73%.

Figures for the first five months already show a 53% increase for total exports, compared to the same period last year. Minister Winde said the growth has been predominately in packaged exports, which showed a 40% increase over the same period. “As tourism and wine exports grow and more Chinese businesses travel to the province, other Western Cape sectors automatically have increased access to trade opportunities with China.”

Minister van Rensburg said government support and good diplomatic relations are crucial for the business community to be successful in China. He said although we have been able to realise good growth in wine exports in recent years, it is now important to protect relationships and build on our reputation for excellent quality and reliable supply. He also stressed the fact that South Africa is the only wine producing country that can track individual bottles of wine from the vineyard up to the final bottled product. “This is a unique guarantee of quality and food safety we offer our trade partners.”

Minister Winde and Minister van Rensburg discussed the possibilities of a city twinning agreement between Yantai and a town in the Western Cape with the Yantai Mayor. They invited the Yantai Local Government to visit the Western Cape to investigate this possibility. Mayor Wang Liang expressed his interest and proposed an official visit to be scheduled for later this year to the Western Cape.

The Western Cape Department of Agriculture in partnership with Wines of South Africa hosted a South African wine tasting in Beijing where 26 producers and importers showcased over 250 different South African wines. This is in line with the Western Cape Department of Agriculture’s commodity approach to support various industries to diversify exports into potential growth markets.
Successful Ostrich Auction at Oudtshoorn Research Farm

Dr Ilse Trautmann – ilset@elsenburg.com

The Western Cape Department of Agriculture’s auction of breeder ostriches was held earlier this year. This is the first ostrich auction since the outbreak of avian influenza in 2011, when thousands of breeder and slaughter birds were destroyed during the outbreak in an attempt to limit the spread of the H5N2 virus. Consequently, the demand for breeding material is greater than normal.

A total of 237 two and three-year old breeder ostriches (109 males and 128 females) were auctioned at the Oudtshoorn Research Farm. The average price obtained for an ostrich was R4 403. The average price for two-year old males and females was R 3 600 and R 4 000 respectively, while three-year old males and females sold for an average of R 4 791 and R 4 773.

A three-year old female ostrich fetched the highest price of R 7 750 on the auction. This female, bought by Mr Ebon le Roux from Oudtshoorn, boasted the highest breeding values of the day for egg and chick production. The same buyer also paid the highest price (R7 000) for a male breeding ostrich.

Seven producers from the Little Karoo area bought all the ostriches. According to the new biosecurity regulations within the ostrich industry, ostriches may only be moved to registered farms, which meant that only those producers whose farms meet the necessary biosecurity requirements could participate in the auction. The auction is a significant outcome of the Western Cape Department of Agriculture’s ostrich research programme; in which ostriches are selected for higher productivity. The research selection strategy involves breeding for growth and reproduction traits. This experimental ostrich flock has already shown significant improvement in growth traits and overall reproduction. The aim of the auction is to make the genetic material of these improved animals available to producers.

The regular replacement of older birds with the more efficient and improved younger generation is one of the principle messages conveyed by the auction. The relatively high average prices received for the breeder ostriches at this auction is an indication of interest by producers and can be seen as a positive sign for the industry.
ABUNDANT HARVEST: 
Success stories in Market Access
The positive stories you don’t read about

Petro van Rhyn - petrovr@elsenburg.com

The Western Cape Department of Agriculture recently launched the second book in their Abundant Harvest series called “Success stories in Market Access”. Where the first book, “Successes in Agriculture”, focused on people and their success in agriculture in general, this book highlights farmers who successfully entered the market through perseverance, strong will, hard work and assistance from the programme Market Access within the Department.

It is essentially about partnerships and how to take hands with government and the opportunities they present to make agriculture in the Western Cape better together.

When launching the book, Minister Gerrit van Rensburg, Western Cape MEC for Agriculture and Rural Development, encapsulated it as follows: “These farmers (featured in the book) are very important to the Western Cape Government, because they are representing the future we believe each and every one of our citizens is entitled to: To be able to grab opportunities, and with hard work and the help of government, create your own destiny. These farmers are a living testimony to our underlying philosophy of doing things “Better together”.

The launch was attended by all the individuals featured in the book and they were also invited to the Minister’s Budget Speech earlier this year – a first for most of them. The book also received high praise from industry stakeholders and they all agreed that if the stories do not appear in the media, then we (as the agricultural sector) must make an effort in finding alternative ways of getting them out there. There are many stories and people need to be inspired and given hope.”
Genetic parameters for growth, as well as qualitative and quantitative meat and skin traits are largely absent in ostriches. Dr Anel Engelbrecht, senior scientist of the Directorate Animal Sciences, Western Cape Department of Agriculture, who also assumes administrative responsibility for the ostrich research facility at Oudtshoorn Research Farm, was promoted at the recent graduation ceremony of the University of Stellenbosch with a dissertation entitled: “Establishing genetic and environmental parameters for ostrich (Struthio camelus domesticus) growth and slaughter characteristics”. In this dissertation Dr Engelbrecht reported all relevant genetic and environmental parameters for slaughter traits on the unique South African Black ostrich genetic resource flock of the Department maintained at Oudtshoorn Research Farm.

Traits studied included live weights at different ages, quantitative meat traits (weights of the slaughter animals, muscles and cuts), qualitative meat traits (primarily pH and colour), quantitative skin traits (area of the skin and the crown as well as that of the neckline) and qualitative skin traits (nodule development and skin defects, as assessed subjectively).

The latter part of the study required the development of a linear scoring system for the evaluation of the subjective skin traits. All traits except skin grading were heritable and variable, ensuring response to purposeful and directed selection in a well-defined breeding programme. Genetic correlations among traits were favourable with only a few exceptions.

The traits with real and current economic value (live weight as proxy for carcass weight, skin size and subjective skin traits) were all favourably correlated on the genetic, environmental and phenotypic levels. Genetic parameters for these traits were linked to economic values to derive provisional selection indexes for slaughter traits in ostriches, based on the amount of information available to use during selection.

The sources of information were on own performance (live weight), parental performance (live weights in their contemporary groups) and live weight and slaughter information from fullsibs that were marketed. The main contributors to annual genetic gains in monetary terms were live weight and skin size, irrespective of the amount of collateral information included in the index.

The annual economic yield of an index including only age-corrected slaughter weight performed comparatively well in relation to the full index, where all traits were recorded. This implies that purposeful selection for slaughter traits could be successfully applied at all levels of recording throughout the industry.

Dr Engelbrecht was jointly supervised by Prof Schalk Cloete from the Directorate Animal Sciences at Elsenburg, Prof Japie van Wyk from the Department of Animal, Grassland and Wildlife Sciences at the University of the Free State and Dr Kim Bunter from the Animal Genetics and Breeding Unit at the University of New England, Armidale, Australia.

Her dissertation drew high praise from an unattached Australian examiner, who stated: “The reporting is very clear, complete and concise and always logical,” and later “The reporting is efficient in the sense that no words are wasted to simply repeat results that are tabled, but informed comments are made such that the text is very readable, interesting and informative. This is somewhat rare for such types of analyses.”

The past couple of years have been very eventful for Dr Engelbrecht, as she was closely involved with the safeguarding of the ostrich resource population at the Oudtshoorn Research Farm during the recent outbreak of Avian Influenza. This outbreak also prompted her to initiate a comprehensive biosecurity plan for the property, an action ably carried forward by Dr Ansie Scholtz, market access specialist at the same Directorate when Dr Engelbrecht had to concentrate more on the writing up of her dissertation during the second half of 2012.

On a personal level, Dr Engelbrecht gave birth to a baby girl during November 2012, emphasising her ability to cope with many and widely divergent tasks at the same time. She is congratulated with this thoroughly all-round performance.
ACCOLADES for PLANT SCIENCES RESEARCHERS
Annelene Swanepoel – annelenes@elsenburg.com

Dr J Labuschagne, Mr H van Zyl, Dr J Strauss and Mr W Langenhoven of the Directorate: Plant Sciences, Programme: Research and Technology Development Services were acknowledged for their outstanding contributions at the 2013 Combined Conference which was held in Durban. The Combined Conference is presented by the South African Society for Plant Production, Soil Science Society of South Africa, Weed Science Society of South Africa and the Horticulture Society of South Africa. Accolades from these societies endorse the relevance and quality of the work of the recipients.

The prize for presenting the “Best paper in Conservation Agriculture” was awarded to Dr J Labuschagne and Mr H van Zyl for their paper titled “Short term effects after introduction of conservation agricultural practices on yield and quality of wheat and canola in the Swartland sub-region of the Western Cape”. The Rovic Leers Conservation Agriculture Award for best poster was presented to Dr J Strauss and Mr W Langenhoven, for their poster “An economic evaluation of short rotation crop and crop / pasture systems at Tygerhoek in the southern Cape”.  

THREE EXTRAORDINARY PROFESSORS
Pavarni Jorgensen – pavarnij@elsenburg.com

Prof R Meeske, Prof SWP Cloete and Prof TS Brand, specialist scientists from the Directorate Animal Sciences, Programme: Research and Technology Development Services, will continue their terms as extraordinary professors at the University of Stellenbosch Department of Animal Sciences after re-appointment by the University. Their appointments endorse their outstanding professional and scientific status and their major contribution to human capital development in terms of post-graduate students and mentorship.
Pieter Swanepoel and Janke van der Colf, scientists with the Directorate Plant Sciences, Programme: Research and Technology Development Services and Stefan Theron, LandCare technician with the Programme Sustainable Resource Management at the Western Cape Department of Agriculture, have been invited to the International Grassland Congress in Sydney, Australia, in September 2013 to deliver paper presentations.

Janke started working at Outeniqua Research Farm near George in 2007 and Pieter followed in 2009. They worked as MSc students under the mentorship of Dr Philip Botha, Specialist Scientist: Pasture Systems, with financial support from the Western Cape Agricultural Research Trust.

Pieter’s MSc study focused on the impact of soil organic matter on Rhizobium bacterial populations in soil and nitrogen fixation by white clover. Janke passed her MSc study on the production potential of kikuyu over-sown with rye grass, cum laude. At the Grassland Society of Southern Africa (GSSA) Congress in 2009, Janke received the award for the best paper by a young scientist.

Pieter and Janke were appointed by the Department in 2011 as Candidate Scientists, and immediately started further research towards their PhD studies. For his PhD research proposal on soil quality of pastures in the Southern Cape, Pieter received the award for the best research proposal at the 46th GSSA Congress. The first data from this project was presented as a paper at the 47th GSSA Congress in 2012, for which he also received the award for best scientific paper. At the same congress, Janke received the award for the best presentation by a young scientist in pastures.

Stefan Theron holds a diploma in civil engineering and has many years of experience as a LandCare technician in the Beaufort West office. He has a keen interest in the management and sustainable utilisation of the Karoo veld for the grazing of small stock. His current work focuses on finding an alternative to fire for manipulating bush encroachment in the arid Karoo region of South Africa. Burning of natural rangeland in order to rejuvenate and increase palatability of grazing is a common practice in parts of South Africa. Concern about the long-term effects on the biodiversity and the depletion of much-needed soil carbon however, led to this investigation.

Pieter, Janke and Stefan were invited to the International Grassland Congress in Sydney, Australia in September 2013 based on the importance of their research. This invitation to the three young scientists shows that both the importance and relevance of the pasture research programme at the Outeniqua research farm and the utilisation of Karoo veld is recognized by an international scientific society.
UNLOCKING the VALUE of the PROUDLY SOUTH AFRICAN CAMPAIGN

Mildred Pheeha - mildredp@elsenburg.com
Enoch Ntala Ralehoko - enochr@elsenburg.com

First conceived at the Presidential Job Summit in 1998, the Proudly South African Campaign was born out of the socio-economic necessity to create jobs, under the leadership of the former South African President, Nelson Mandela. The campaign is aimed at creating and sustaining quality jobs but encouraging the nation to contribute towards the economic growth and prosperity of the country through buying locally produced goods and services, thereby increasing employment opportunities and reinforcing national pride. Proudly South Africa has been running a number of events focused on driving the Proudly South Africa Campaign. These events included edutainment (educational entertainment for younger people), exhibitions and meetings with business in an attempt to communicate and spread the Proudly South Africa Campaign agenda.
On 26 November 2012, Enoch Ralehoko from the Marketing and Agribusiness Division of the Western Cape Department of Agriculture attended the Proudly South Africa Buy Local Summit & Christmas Festival Buy Local Expo. This also coincided with the launch of the Proudly South Africa Local Procurement Accord Database found on the Proudly South African website (www.proudlysa.co.za). The attendance of Deputy President Kgalema Motlanthe demonstrated the seriousness with which the campaign is taken by government. It was mentioned that state-owned companies bought goods and services to the value of R212,7 billion in 2011 alone. Documents such as the Preferential Public Procurement Framework Act 2000, the New Growth Path, the Industrial Development Policy Action Plan 2 (IPAP2) and the National Development Plan indicate opportunities for growth and focus. These documents spell out the terms and requirements for local content and skills in all new development projects.

It is worth mentioning that through the promulgation of the Preferential Procurement Policy Framework Act in 2011, the Department of Trade and Industry (DTI) stipulated sectors and products that departments, agencies and State-owned enterprises had to procure from local manufacturers or providers. The first wave of products was designated, and this included rolling stock, buses, canned vegetables, clothing, textiles, footwear and leather products and set-top boxes, while certain pharmaceutical products were selected in the wave of designations. There has already been a great deal of work done to further this. Toyota has agreed to assemble about 10 000 Quantum taxis in Durban by 2014 out of the 23 000 that is imported every year, including support to Prestige Clothing for their expansion resulting in 300 more job opportunities in Caledon. Lastly, support was given to Boland Pulp with the manufacturing of new products and new packaging.

A number of bodies including retailers, government and civil society groups signed a pledge to purchase more goods and services from South African producers. It must also be noted that correct labeling of products will receive attention as the labeling should also guide buyers on issues of originality of the product they procure. The DTI has committed funding mechanisms to assist in the development of essential products not available in South Africa and to assist companies to develop or innovate certain processes or products in their value chain responsible for the final goods. These could be done to improve the competitiveness of the locally manufactured products against foreign imports.

The ‘eat well, eat safe, eat local’ programme launch was held on 16 April 2013 at the Maponya Mall in Soweto, organised by the DTI in collaboration with the Proudly South Africa and the Culinary Association of South Africa (CAASA). The aim of the Programme was to prevent the consequences of obesity through educating the general public about nutrition and how to prepare a healthy meal. It will also function as a platform to market and promote the consumption of local produce to preserve and protect jobs in the agro-processing spectrum. Food processing companies such as Boland Pulp exhibited new processed and innovated products such as fruit juice purees and canned fruits. Other companies include African Micro-mills who exhibited their product range and Chef Khumalo who is the president of the CAASA and a celebrity chef, demonstrated cooked food items.

In 2012 different stakeholders signed an ambitious pledge to have about 75 percent locally produced products and services in their procurement. This campaign therefore provides possible opportunities for manufacturing companies to increase their local content in their production and products and to do more business with government-owned institutions.

There is also interest expected from retailers to stock more locally produced products that could be taken into their stores locally and all over Africa which will benefit job creation and economic growth in the province and nationally. There needs to be innovative ways to increase green technologies, value chains, packaging etc. in line with global changes and the provincial 110 percent green strategy.
Pet overpopulation and the resulting neglect and disease transmission risk was identified as a serious problem in the Western Cape. To combat this, the Western Cape Department of Agriculture (WCDoA) teamed up with the Stellenbosch Local Municipality, several animal welfare organisations and veterinarians and began a pet mass sterilisation pilot project in Kayamandi, Stellenbosch. The aim of the project was to sterilise at least 70% of the pets within Kayamandi, vaccinate them against rabies and provide animal care education to the community. To evaluate the effect of the project, pet census data was collected before and after the project and will continue to be monitored until a year after the completion of the sterilisations. The sterilisation goal was achieved and the follow-up monitoring of the pets in Kayamandi is currently ongoing. It is hoped that this project is shown to be a long-term success so that similar projects can be rolled out in other parts of the Western Cape, the first of which has already begun in Klapmuts, using funding remaining after the sterilisations in Kayamandi were finished.

The involvement of welfare organisations - human and animal - the veterinary profession through both professional bodies and individual veterinarians, different levels and departments of government, members of the community and corporate sponsors all played a role in the operational achievements of the project but also served the greater purpose of demonstrating the possibilities that arise when collaborating on projects such as these.
During the surgical phase of the project 85.6% dogs and 93.8% cats were sterilised totaling 854 pets in total. This represented approximately 86.6% of the Kayamandi pet population at the time of sterilisation.

Some of the project highlights include:

1. The official launch of the project included the Premier, the Minister for Agriculture and Rural Development, the mayor of Stellenbosch, HOD of the Department of Agriculture, several mayoral committee members for the municipality of Stellenbosch and ward councillors for Kayamandi.

2. Pet census was preceded by training of volunteers at Kayamandi High School and team leaders. 1,035 pets were counted with 70% being dogs and the remaining 30% cats. 20% of the pets had already been sterilised. In total 1.6% of counted Kayamandi households had pets at a rate of 1.74 pets/pet owning household. This figure was much lower than expected. Follow-up census has also been performed with another census envisaged for 2014.

3. An estimated 92% of the population were vaccinated against rabies during the census phase.

4. The Humane Education curriculum was successfully implemented for Grade 3 learners in all the primary schools, with an award ceremony at the Kayamandi Primary School. The Cape of Good Hope SPCA humane education team also visited all the Kayamandi schools with a puppet show and other education tools and material.

5. Volunteer pet census workers received certificates and tokens of appreciation, including clothing for the 11 participating 17-18 year-old children in protection programmes of the Department of Social Development.

6. An excellent production on pet care by the Jungle Theatre Company: “A dog’s life” was presented at the Kayamandi High School for Grade 8 pupils and iKhaya Trust Centre for primary school children.

7. Animal welfare assistant (AWA) workshop and official training towards authorisation as AWA with the South African Veterinary Council were offered at Amazink in Kayamandi. Both events were well attended with 83 people attending the welfare workshop and 39 people attending the AWA training.
Recent conflicts in rural areas have shown that the challenges facing the Western Cape agriculture sector are beyond the scope of any one stakeholder or sphere of government to resolve. To this end, the Future of Agricultural and the Rural Economy (FARE) process was launched at Elsenburg on 26 April 2013, following four months of consultation and deliberation with roleplayers comprising different spheres of government, labour, organized agriculture, NGOs and smallholder farmers.

A FARE steering committee has been established, co-chaired by Andrew Boraine from the Western Cape Economic Development Partnership (EDP) and Philip Dexter from the Western Cape Economic Development Forum (EDF). This committee has in turn tasked a panel of non-political and independent experts in the sector to take the process forward. The panel includes Antonie Gildenhuys, Venete Klein, Jan Theron, Karin Kleinbooi, Thom Thamaga, Adrian Sayers and Frans van Wyk.

The panel has been engaging directly and privately with the broadest range of stakeholders in various geographical areas throughout the Western Cape Province, to receive inputs on the future of agriculture and the rural economy in general. It will also consider the successes and limitations of previous social dialogue and mediation initiatives.
Stakeholders are invited to give inputs on all aspects relevant to agriculture and the rural economy, which can include the following:

- Challenges that exist in agriculture and the rural economy;
- Transformation in rural areas;
- The promotion of social dialogue, and obstacles which impede social dialogue;
- The creation of jobs, and the kind of jobs which can and should be created;
- The state of education in the rural areas, and obstacles which impede access to education;
- The availability and quality of housing, and obstacles which prevent access to housing;
- Access to land and water resources, and how access can be improved;
- The future of agriculture in terms of where it is expected to stand in the next three to 10 years and what can be done to secure its success.

Stakeholders engaged with include municipalities and government departments, community organisations, faith-based groups, NGOs, trade and labour unions, farmer associations, chambers of commerce, and individuals who occupy key positions in the area. Inputs from stakeholders are made by way of written submissions, formal presentations or informal discussions.

Stakeholders who want to engage with the FARE panel are asked to contact Malikah Uys (082 769 0559) or Lyndon Metenbo (082 462 0583) or email admin@fare.org.za. Stakeholders may also submit written presentations without meeting with the panel. Written presentations can be sent to admin@fare.org.za.

The FARE panel continuously seeks for submissions from groups with concerns in the sector. They would like representatives from rural businesses, agricultural organisations and other rural economic players to send submissions or meet with them to share their thoughts on the causes of the underlying problems and the solutions they see.

It is important for all the players' voices to be heard and so this is an opportunity to do just that.

PANEL ENGAGEMENTS HAVE TAKEN PLACE IN THE FOLLOWING AREAS:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Location</th>
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<tr>
<td>3rd</td>
<td>Caledon</td>
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<tr>
<td>4th</td>
<td>Grabouw/Elgin</td>
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<tr>
<td>10th-11th</td>
<td>Elsenburg (Stellenbosch, Wellington, Paarl &amp; Franschhoek also included)</td>
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<td>12th</td>
<td>Philippi</td>
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<td>15th, 16th, 17th</td>
<td>Elsenburg</td>
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<td>29th</td>
<td>George</td>
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<td>05th</td>
<td>Beaufort West</td>
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OUR PLAN FOR FARM WORKERS AND FARMERS

The Western Cape Government wants to work together with farm workers and farmers to address their concerns. Together we can make it better.

Here are our plans:

1. A helpline, number 0860 142 142, dedicated for farm worker issues.

2. Investigate new housing models for farm workers.

3. Training courses for farm workers to use high-tech equipment.

4. Engagement sessions for farm workers and farmers.

5. Support for farm worker structures and development programmes.

6. Investment in sport opportunities for farm workers.

7. Youth empowerment in rural areas.

8. Ethical trade initiatives.


10. A Province-wide farm worker survey.

11. A farm worker communication strategy.

12. Finance an independent research project, Future for Agricultural and Rural Economy, (FARE) to build a shared future vision for the provincial agricultural sector.
Melkproteïen-en melkvet-inhoud bepaal tot ’n groot mate die melkprys vir produrente wat lewer aan melkkopers wat kaas en ander suiwelprodukte maak. Die melkboer moet poog om die maksimum kilogram proteïen en melkvet te produseer om winsgewendheid te verhoog. Daar is ’n negatiewe verwantskap tussen melkproduksie en die vet-persentasie van melk. Koeie wat vroeg in laktasie is en hoog produseer se melk bevat gewoonlik ’n laer vet persentasie as koeie in laat laktasie wat minder melk produseer. Indien koeie hoë vlakke kragvoer wat ’n hoë styseinhoud bevat gevoer word, kan dit lei tot laer rumen pH, ’n daling in getal veselverterende bakterieë, laer vlakke van asynsuur in die rumen en verlaagde melkvetpersentasie. Melkvet-persentasie word verlaag wanneer koeie nie voldoende effektywe vesel inneem nie. ’n Studie uitgevoer op Outeniqua Navoringsplaas het getoon dat die gedeeltelike vervanging van mielies met hominychop, gluten 20 en semels in die kragvoer, gevoer aan koeie wat op raaigras wei, melkvet van 4.07% tot 4.75% verhoog het, terwyl melkproduksie nie verlaag het nie.

Melkvet word soos volg gevorm. Die vertering van vesel in die rumen deur bakterieë produseer vlugtige vetsure (asynsuur en betahidroksiebottersuur). Bottersuur word omgeskakel na betahidroksiebottersuur in die rumenwand. Die helfte van melkvet word in die uier gesintetiseer vanaf asynsuur en betahidroksiebottersuur. Die ander helfte van melkvet kom vanaf vetsure wat in die bloed sirkuleer en is afkomstig vanaf mobilisasie van liggaamsvet, absorpsie uit die dieet en metabolisme van vette in die lever. Melkproudelen word in die uier gesintetiseer vanaf aminosure en die proses benodig glukose. Glukose is afkomstig vanaf metabolisme van propionsuur (afkomstig van die rumen) in die lever of word direk geabsorbeer uit die dunderm. Indien te min propionsuur uit die rumen geabsorbeer word, moet die koei aminosure afbreek om glukose te vorm en dit verlaag voorsiening van aminosure om mikrobiese proteïen te vorm. Indien die dieët te min proteïen bevat kan dit melkprouden met tot 0.2% verlaag. Vul proteïen aan en verseker dat die totale dieët 17 tot 18% proteïen bevat. Verseker dat 33 tot 40% van die proteïne in die diët rumen verbyvloei proteïen is. Weiding bevat lae vlakke van metionien. ’n Studie gedoen op Outeniqua Navoringsplaas het gevind dat melkprouden met 0.24% en melkvet met 0.76% gestyg het wanneer die diët 25% van die rumen totale diët bevat en 4% van die kragvoer ingesluit word in vergelyking met kragvoer sonder vismeel. Die metionienvlakke was aansienlik hoër in die kragvoer wat vismeel bevat het. Maak seker dat die diët van koeie voldoende effektywe vesel bevat, maksimeer inname en maak seker dat NFC (non fibre carbohydrate) vlakke van die dieet tussen 25 en 45% is. Die vlak van NDF (neutraalbestande vesel) in die dieët moet nie laer as 28% op ’n DM basis wees nie. Indien die NDF-inhoud van die totale diët meer as 40% is, sal inname benadeel word en melkprouden kan verlaag. Genetika het ’n groot invloed op melkvestowwe. Die oorerfbaarheid van melkvet en melkproteïen is hoog. Seleksie van bulle met goeie teelwaardes vir kg proteïen (+15-20kg) en kg botteter (+25-30kg) wat ook positief is op persentasie vastestowwe, sal melkvestowf produksie en inhoud van kuddes verhoog. Jersey koeie op raagrasweiding.
Forty enthusiastic young PAY Interns reported to the Department of Agriculture on 15 April 2013, with great excitement and slight trepidation. They had all attended a week-long work readiness training and were carefully attempting to project all lessons learnt on the course. Commendably, this diverse group of youths were well prepared, displaying an impressive level of maturity. Although hailing from various suburbs, including, Strandfontein, Mitchell’s Plain, Maitland, Khayelitsha, Grassy Park, Wynberg and Phillipi they were punctual, after some having to leave home as early as 5am in the morning, to reach Elsenburg before 8am. No complaints were received as they built up their confidence, knowledge and understanding through an extensive two-week orientation programme which included an introduction to the Department of Agriculture, climate change, organic farming and a Landcare Camp in Tulbagh. Team work and willingness to learn and improve their skills, were the strong points identified throughout the orientation. The Landcare Camp was an ‘awesome’ experience with most revealing in their new-found knowledge of the dangers of alien vegetation, indigenous plants and trees, water conservation, soil erosion and fynbos. They all returned quite the experts, with vigorous spirits, seeing this internship year as their opportunity to plot their future careers and achieve their personal goals.
CAPE TOWN TO HOST IFAMA’S 24TH ANNUAL WORLD FORUM AND SYMPOSIUM

The International Food and Agribusiness Management Association (IFAMA) announced at its 23rd Annual World Forum and Symposium that Cape Town, South Africa, will host the 2014 event.

“The more than 60 food and agriculture industry leaders speaking at this year’s World Forum and Symposium focused considerable attention on Africa – specifically the importance of addressing Africa’s growing business prospects, the food security challenge and agribusiness talent needed to ensure agriculture’s future,” said Johan van Rooyen, Director of the Standard Bank Centre for Agribusiness Development and Leadership, University of Stellenbosch and Chair, 2014 IFAMA Program Planning Committee. “Selecting Cape Town as the site for next year’s event will help underscore the importance of addressing these vital needs.”

In accepting the offer to host IFAMA’s 24th annual World Forum and Symposium in South Africa, Ebrahim Rasool, South Africa’s ambassador to the United States, encouraged global and agri-food businesses to attend the forum. He also noted that attendees should allow sufficient time to experience South African hospitality, the beautiful countryside, the winelands and the many historical sites close to Cape Town.

“People feed the world. And as agribusiness leaders, it is our responsibility to develop future generations of talent passionate about creating and implementing solutions that will ensure we can overcome the food security challenges in Africa and around the world,” said Thad Simons, President and CEO, Novus International, and President of IFAMA.

2014 Program Chair:
Johan van Rooyen
Director, Standard Bank Centre for Agribusiness Development and Leadership Stellenbosch University South Africa.
cjvr@sun.ac.za

2014 Program Secretariat:
Lindie Stroebel
AgBiz: Manager Economic Intelligence and Finance Pretoria, South Africa.
lindie@agbiz.co.za
Effect of different carbon dioxide levels during artificial incubation on hatchability of ostrich eggs
Dr Z. Brand & Prof S.W.P. Cloete

The effects of free stall design and free stall surface material on the behaviour of lactating Holstein cows
Dr C.J.C. Muller, V. Visser, A. Schmulian & J.A. Botha
Effect of different carbon dioxide levels during artificial incubation on hatchability of ostrich eggs

Dr Z. Brand1 & Prof S.W.P. Cloete1,2
1Directorate: Animal Sciences, Western Cape Department of Agriculture, 2Department of Animal Sciences, Stellenbosch University

Corresponding author (email): ZanellB@elsenburg.com

Take-home message

The role of different levels CO2 in the development of ostrich embryos is still unclear. It was claimed by some industry sources that higher CO2 concentration during incubation may enhance hatching results. Eggs were artificially incubated in three different incubators with three vent settings (close, 50% open or open). The three vent settings did not affect the percentage of infertile eggs or embryonic mortalities. The results of the study indicate that an increase in CO2 concentrations during incubation, is not beneficial in the hatching process and cannot therefore be recommended.

Introduction

Little is known about the gas exchange of the ostrich embryo in relation to its development. Van Schalkwyk et al. (2002) published results from a study undertaken to establish reasonable oxygen (O2) and carbon dioxide (CO2) concentrations in the incubator throughout incubation. Although this study determined the requirements of the developing embryo, it did not assess the influence of different levels of CO2 on the development and subsequent survival of the embryo. The fact that ostrich eggs are usually incubated in multi-stage incubators makes it difficult to advise incubation operators as to how to regulate ventilation during incubation.

Different levels of CO2 play an important role in the development of embryos. Gildersleeve & Boeschen (1983) reported a higher hatchability, lower embryo mortalities and lower levels of malpositioning for turkey eggs when CO2 levels were no more than 0.3%. Studies showed that a gradual increase in CO2 levels during the first 10 days of incubation of chicken eggs enhanced embryo growth and improved hatchability, but after 10 days of incubation this practice had no effect on hatchability (Carlsea et al. 2012). Chicken embryos exhibit an increased tolerance to higher CO2 concentrations (0.5%) during the second half of incubation and it thus suggested that CO2 may stimulate embryonic development within certain limits (Wilgus & Sadler, 1954). Romanoff (1930) and Barott (1937) found that CO2 concentrations above 1% resulted in slow growth, a high incidence of abnormalities and early embryonic deaths in chickens. Taylor & Kreutziger (1965) found a significant reduction in hatchability at the CO2 level of 3%, declining to the point of total fatality at >8% CO2. Contradictory Everaert et al. (2007) found that chicken embryos can tolerate high (4%) concentrations of CO2 between day 10 and day 18 of incubation without any effect on pre- and postnatal growth, embryonic mortality and hatchability. There also seems to be evidence of synergistic action between combinations of CO2 and O2 with a significant increase in the lethal effect upon embryos beyond additive effects of the 2 gases operating individually (Taylor & Kreutziger, 1965).

The aim of this study was to test the hypothesis that higher CO2 concentration during incubation may enhance hatching results, as was claimed by some industry sources.

Materials & Methods

The experimental population used during the period of the study (2007 to 2009) was the commercial, pair-bred ostrich flock at the Oudtshoorn Research farm, South Africa. The flock consisted of 188 breeding pairs, aged between 2 and 11+ years-old. The husbandry and management of the flock has been described previously by Brand et al. (2008a, b; 2009). The methods of egg collection, sanitation and storage of eggs on the research farm are well documented (Van Schalkwyk et al. 1998; 1999; Brand et al. 2007). The fate of each individual egg was recorded as described by Bunter (2002). Unless specified otherwise, each breeding bird received a ration of 2.5 - 3.0kg dry matter/day throughout the breeding season, which lasted from the beginning of June until the end of January of 2007. Outside the breeding season (February - May), male and female birds were kept in separate flocks for resting. From 2008 the breeding season started in mid-May and ended in mid-December.

Eggs were randomly collected and stored for no more than 6 days at a temperature of 17°C and relative humidity (RH) of 75%. Eggs were then artificially incubated at 36°C and 24% relative humidity in three identical La International® incubators. The La International® incubators used during this trial have a maximum capacity of 72 eggs (24 eggs in each incubator). The incubators were set to to hourly turn eggs automatically through 60°. The vents of the three incubators were set at either fully closed, 50% open or fully open. These vents setting were repeated for each incubator within a replication, in order to establish both the effect of CO2 levels and incubator on hatching success. It was expected that the CO2 concentrations of the closed incubator would increase gradually by natural build-up of CO2 due to air-tight closure of the incubator from day one to day 35 of incubation. During the first five weeks of incubation the incubators were not opened. Daily records of the percentage of CO2 and O2 concentrations were obtained for each incubator with a Multigas Detector Orionplus meter. Incubated eggs were candled and weighed on day 35 of incubation. After weighing the eggs on day 35 of incubation, the eggs were placed back into the La International® incubators, set vertically on rings with the air cell pointing upwards. Eggs not showing any macroscopic embryonic development after 21 days of incubation were regarded as infertile and were not considered in any analyses, whereas those with clear evidence of embryonic development that had subsequently ceased were considered as early embryonic mortalities.
Subsequent mortality (> 21 days of incubation) was classified as late embryonic deaths. Hatchability was recorded for all eggs. The trial was repeated for three breeding seasons, resulting in data of 648 eggs at the end of the trial period.

The trial design was a 3 x 3 replicated latin square design (each incubator was objected to all three treatments on three occasions, yielding 24 observations) and the data were subjected to analysis, using ASREML software (Gilmour et al., 1999). Traits considered were the percentage of infertile eggs, early embryonic mortalities (EEM), late embryonic mortalities (LEM) and overall embryonic mortalities (OEM), chicks that hatched from fertile eggs (chickfert) and chicks that hatched from egg set. Arcsin transformation was used to increase variance in data.

Results & Discussion

Oxygen concentrations remained relatively constant at 20.9% for the first 34 days of incubation for the treatments where the vents were either 50% open or fully open (Figure 1). After day 34 of incubation the O₂ concentrations for the treatment where the vents were 50% open (20.863 ± 0.015) were significantly lower than O₂ concentrations in incubators where the vents were fully open (20.875 ± 0.015). The concentrations of O₂ for the incubators with closed vents did not divert from the other two treatments up to day 18 of incubation, whereafter a significant (P< 0.05) reduction occurred in O₂ concentration, continuing up to day 37 of incubation (20.4%). After 37 days of incubation the O₂ concentrations increased up to pipping (20.6%). Results for the CO₂ concentrations are a mirror image of results for O₂ concentrations as shown in Figure 2. Carbon dioxide concentrations stay relatively constant at undetectable concentrations (recorded as 0.01%) during the first 30 days of incubation for the treatments where the vents were 50% open and fully open. After day 30 of incubation the CO₂ concentrations for the treatment where the vents were 50% open increased significantly and stayed higher for the rest of the incubation period than the CO₂ concentrations in incubators with closed vents (32.3% for closed vents vs. 28.2% for open vents; Table 1). Everaert et al. (2010) reported a reduced hatchability under high CO₂ conditions due to higher late mortality of fully developed chicks before internal pipping. The hatchability of set eggs in the open vent treatment were actually slightly higher in absolute terms than those eggs incubated in incubators with closed vents (39.4% for closed vents vs. 43.3% for open vents; Table 1).

Table 1 The effect of the three different treatments (vents closed, 50% open and fully open) on rotten eggs, infertile eggs (infert), early embryonic mortalities (EEM), late embryonic mortalities (LEM), overall embryonic mortalities (OEM), chicks from fertile eggs (chickfert) and chicks from egg set.

<table>
<thead>
<tr>
<th>Trait</th>
<th>Closed</th>
<th>50% open</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEM</td>
<td>13.9 ± 3.46</td>
<td>9.09 ± 3.46</td>
<td>11.33 ± 3.46</td>
</tr>
<tr>
<td>LEM</td>
<td>32.3 ± 2.44</td>
<td>29.1 ± 2.44</td>
<td>28.2 ± 2.44</td>
</tr>
<tr>
<td>OEM</td>
<td>40.5 ± 2.83</td>
<td>36.9 ± 2.83</td>
<td>37.3 ± 2.83</td>
</tr>
<tr>
<td>Chickfert</td>
<td>45.5 ± 4.33</td>
<td>45.5 ± 4.33</td>
<td>48.0 ± 4.33</td>
</tr>
<tr>
<td>Chicks</td>
<td>39.4 ± 4.02</td>
<td>39.9 ± 4.02</td>
<td>43.5 ± 4.02</td>
</tr>
</tbody>
</table>

Conclusion

The results of the project indicate that closed vents, leading to increased CO₂ concentrations during incubation, are not beneficial in the hatching process and can therefore not be recommended. The hypothesis that higher CO₂ concentrations may result in better hatching results can thereby be refuted.
References


Taylor, L.W. & Kreutziger, G.O. 1965. The Gaseous environment of the chick embryo in relation to its development and hatchability. 2. Effect of carbon dioxide and oxygen levels during the period of the fifth throughout the eight days of incubation. Poultry Science. 44, 98-106.


The effects of free stall design and free stall surface material on the behaviour of lactating Holstein cows

Dr C.J.C. Muller¹, V. Visser², A. Schmulian² & J.A. Botha¹
¹Directorate: Animal Production, Western Cape Department of Agriculture, ²Cape Peninsula University of Technology, Wellington 7655
Corresponding author (email): CallieM@elsenburg.com

Take-home message

Economic pressure has caused dairy farmers in the Western Cape to expand their herds. This is recently being done by using intensive free stall housing systems providing protection against summer heat and wet winter conditions. The design and management of free stalls affect the welfare of cows as stalls could be under-utilized resulting in cows standing longer per day or cows could be injured when getting up or lying down. In this study the behaviour of cows was determined by using a closed circuit camera over consecutive 24-hour periods. Two experiments were conducted to determine the effect of lunging space (with and without a wall in front of the stalls) and free stall bedding material (sand vs. foam mats) on the behaviour of cows. Cows spend more time lying-down in stalls without a wall at the front-end of the free stall in comparison to stalls with a wall in front reducing lunging space. This resulted in a shorter standing time for cows with access to stalls with more lunging space possibly improving the welfare of cows. The occupancy rate of stalls with more lunging space was higher over a 24-hour period, 47.3 vs. 41.7%. Cows with access to sand-filled stalls were lying down longer than cows with access to stalls with foam mats. This has resulted in cows standing for a longer period over a 24-hour period which reduces the welfare of cows. However, at the end of the experiment when the cows were given a free choice, some cows chose the foam mats above the sand bedding while also showing a preference for specific stalls. Cows using stalls with foam mats were lying down for a shorter period than cows using sand-filled stalls. They would rise more often and were only lying down for short periods at a time. From this it seems that cows were not used to using stalls with foam mats. The two experiments showed that cows demonstrated a preference for stalls with more lunging space and sand bedding instead of mattresses.

Introduction

In the Swartland area of the Western Cape Province of South Africa, dairy cows are mainly kept in open camps (dry lots) with feed being provided to them in feed troughs twice a day (Muller & Botha, 1997). Cows are grouped according to milk production or stage of lactation. Due to economic pressure, the number of cows within herds has been increasing, even though often using the same farm layout and facilities. Because of relative mild weather conditions in this area, there has been little pressure on farmers to provide protection to cows against summer heat and cold wet winter conditions. As the genetic merit of cows has increased over the last 20 years, local farmers have become more aware of the negative effects of adverse weather conditions on the production of dairy cows while the high rainfall during winter creates very poor conditions in the dry lots. Cows are also exposed to heat stress conditions during summer. In countries experiencing extreme cold conditions during winter, appropriate housing systems have been designed and cows are kept indoors for most of the year. In the United States of America (USA) free stall housing has been a popular housing facility since the early 1960's (Friend et al, 1977). In Israel, with similar climatic conditions as the Western Cape although having a drier winter period, housing systems are designed to protect cows against extreme summer heat. There is at present a considerable interest in the housing of dairy cows as farmers are also realising the long term effect of cow comfort.

Better housing conditions ensure a longer productive life for dairy cows (Loubser, 2012). Although some farmers have already put up housing structures, there is, however, a lack of knowledge concerning the effect of free stall design and management on the behaviour and milk yield of dairy cows. The aim of this study was to determine the effect of free stall design and free stall surfaces on the behaviour of lactating Holstein cows.

Materials and Methods

Two experiments were conducted at the Elsenburg Research Farm of the Western Cape Department of Agriculture. Elsenburg is situated approximately 50 km east of Cape Town at an altitude of 177m, longitude 18° 50’ and latitude 33° 51’ in the winter rainfall region of South Africa. For both experiments, 10 cows were divided into two groups of five cows each according to stage of lactation and average milk yield during a 3-week preliminary period. At the start of each experiment cows were at least eight weeks but not more than 200 days, into their respective lactations. The average daily milk yield and lactation number of cows over all experiments was 33.2±6 kg and 2.2±0.4, respectively. Groups of cows were randomly allocated to treatments. The experiments were conducted in a section of a free stall housing system using ten individual free stalls in each experiment. This section of the housing system was divided into two parts of five free stalls each. Measurements of free stalls were 2.4m long and 1.2m wide. In Experiment 1 five free stalls had a wall (1.5m high) at the front of the stall thereby limiting lunging space for cows lying down or getting up. For the remaining five free stalls the wall was removed to provide ample lunging space for cows to lie down and to get up comfortably.

In Experiment 2 sand-filled free stalls were compared to free stalls fitted with cow mattresses (Foamats from Foxworthy Supplies, Michigan, USA). Foamats consist of a foam base that is covered by a non-permeable top layer to protect the base from getting wet. Five originally sand-filled free stalls were modified to install mattresses on a permanent basis. Sand bedding was removed and replaced with compaction material on which a layer of at least 100mm of concrete was added to create a hard and level surface to put the Foamats on. This was to ensure that mattresses were installed on a flat, hard surface to prevent lumps occurring in the mattresses which would make it uncomfortable for cows to lie down on. Approximately 2kg of coarsely chopped wheat straw was put on top of each mattress to reduce friction of the skin on the rubber mats and to absorb urine and manure.

In the free stalls without mattresses, sand was used as bedding material. The management protocol of sand-filled stalls, i.e. filling
up and levelling, was the same for both studies. Every morning and afternoon while the cows were in the milking parlour, the manure and urine patches were removed from the sand and the sand in the stalls levelled. Fresh sand was added into the stalls at least once a week. Manure on the mattresses was similarly removed and freshly-chopped straw added to the bedding area.

For both studies, a group of five cows was confined to a specific free stall type for a 2-week period. This was followed by a week during which the cows’ daily behaviour was monitored over a 48-hour observation period using two closed circuit security cameras. The gate separating the free stall types was then opened and cows switched to the other treatment. After another 2-week adaptation period, the behaviour of cows was similarly monitored over a 48-hour period. After this period, the gate was permanently opened and cows were offered free access to both types of free stalls. During this period the preference of cows for a specific free stall type was determined. Images were stored on a computer programme and the individual activities of each cow were determined at a later stage. Photographs were taken of each cow beforehand to enable identifying cows by their markings for the recording of activity data. Data recorded for each cow included the following, i.e. time spent lying down, time standing in the free stalls, time standing in the manure alley, time standing halfway into the stalls (perching), eating at the feed troughs and drinking water.

At every half hour of each observation period, the number of cows engaged in a particular activity was counted. The percentage of cows engaged in feeding, standing and lying down was calculated for each experimental group. Data for the main activities were plotted against time to indicate changes in behavioural patterns. The occupancy rate of the different free stalls was calculated according to the formula of O’Connell et al. (1993). Occupancy is \( T(y)/P \cdot 100 \) where \( T \) is the sum of the number of cubicles of type (y) occupied at each 30 min observation scan; \( P \) represents the number of cubicles of type (y) \( \times \) the number of 30 min observation scans. All cows in the three experiments received the same total mixed ration (TMR) consisting of alfalfa hay, oat hay, wheat, corn, wheat bran, cottonseed-oil cake meal, minerals and salt providing 150 g CP and 10.05 MJ ME/kg. Feed was provided ad libitum into individual feed bins twice a day during the time when the cows were in the milking parlour. Refusals of feed were removed on a daily basis. Cows were machine-milked twice a day at 05:30 and 15:00 in a milking parlour. Data on the activities of each cow were pooled within the two experimental periods. Differences in the time cows spent eating, standing and lying down in the two free stall types for the three experiments were compared by one way analysis of variance using the Statgraphics Statistical package.

**Results and discussion**

**Experiment 1**

All but one of the cows in this experiment completed the nine weeks of the experimental period. One cow became sick because of mastitis after switching to the other treatment. She was then culled from the herd and her records in the second part of the trial were not used in the statistical analysis.

The cows spend more (\( P < 0.05 \)) time lying down in stalls without a wall at the front of the free stall in comparison to stalls with a wall (Table 1). Lying-down time for cows in the free stalls without and with a wall in front of the stalls was 57 and 48% respectively of the time while they were in the housing system. As the time spent feeding was the same for both free stall types, this has resulted in cows standing for a shorter period (\( P < 0.05 \)) in stalls without a wall at the front of the stall. For both types of free stalls, cows spent almost the same amount of time standing in the manure alley as perching (standing half-way into the stalls with their front feet inside the stalls). Perching was more than 40% of the time standing for cows with access to free stalls with and without a wall at the front of the stalls. Although the absolute values for the occupancy rate of free stalls over a 24-hour period was higher for stalls without a wall at the front end of the stalls in comparison to stalls with a wall, i.e. 47.3a1.9 vs. 41±7.0%, differences were not significant (\( P > 0.05 \)).

TABLE 1 Mean ± SE daily activities of cows with access to free stalls with and without a wall in front of the free stalls (\( P = Probability; LSD = Least significant differences)\)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Free stalls with a wall</th>
<th>Free stalls without a wall</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total time lying down (min)</td>
<td>646±27</td>
<td>758±28</td>
<td>0.007 79</td>
</tr>
<tr>
<td>Total time spent standing (min)</td>
<td>380±32</td>
<td>254±21</td>
<td>0.003 79</td>
</tr>
<tr>
<td>Time spent lying in the free stalls (min)</td>
<td>50±26</td>
<td>34±41</td>
<td>0.048 16</td>
</tr>
<tr>
<td>Time spent in the manure alley (min)</td>
<td>136±27</td>
<td>113±11</td>
<td>0.170 63</td>
</tr>
<tr>
<td>Time spent in the free stalls (min)</td>
<td>147±25</td>
<td>107±16</td>
<td>0.040 64</td>
</tr>
<tr>
<td>Total time spent eating (min)</td>
<td>319±16</td>
<td>31±15</td>
<td>0.720 45</td>
</tr>
</tbody>
</table>

The percentage of cows lying down in free stalls with and without a wall at the front of the free stalls during the day and night is shown in Figure 1. After feeding in the morning at 08:00, 70% of cows were lying down in free stalls without a wall in the front while only 20% of cows were lying down in stalls with a wall at the front. Cows would get up again to feed and to ruminate while standing. In the evening from 21:00 70% of cows were lying down to about 06:00. During the same time, fewer than 40% of cows were lying down in stalls with a wall in front of the stalls. The cows with access to free stalls with the wall in front were lying down for shorter lying-down periods than the cows without the wall in front. Cows were standing more often during the night, moving from one stall to the other. For cows without the wall in front it was easier to get up as there was sufficient space to lunge forward while cows in the free stalls with the wall in front had to lunge sideways in order to rise. This often caused cows hitting the stall divisions. When lying down in the free stalls with the wall in front, cows had to keep their heads turned to the side while cows with no wall in front could lie down in a normal resting position. From these results it seems that cows showed a preference for the free stalls that offered them more lunging space.

**Experiment 2**

As expected, similarly as in Experiment 1, cows spent most (> 50%) of the day lying down. Their lying-down time was longer (\( P > 0.05 \)) in sand bedded free stalls in comparison to stalls with installed Foamats (Table 2). This has resulted in cows standing for a longer (< 0.05) period during the day and night in stalls with Foamats than in sand-filled stalls, i.e. 55 and 66% respectively. The rest of the standing time was divided between standing in the manure alley (24 and 12%) and perching (22 and 21%). At the end of the experiment when the cows were given a free choice, some cows chose the Foamats above the sand bedding while also showing a preference for specific stalls. Cows with access to Foamats did not lie down for long periods at a time, which was the case with cows on sand bedding. They would rise more often and were only lying down for short periods at a time.

![Figure 1: The percentage of cows lying down in free stalls with (□) and without a wall (◇) in the front of free stalls during the day and night.](image)
Table 2 Mean ± SE daily activities of cows with access to free stalls with sand and Foamat mattresses as bedding material (P = Probability; LSD = Least significant differences)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Foamats with sand</th>
<th>Free stalls</th>
<th>P</th>
<th>LSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total time lying down (min)</td>
<td>673±31</td>
<td>773±27</td>
<td>0.02</td>
<td>84</td>
</tr>
<tr>
<td>Total time spend standing (min)</td>
<td>387±24</td>
<td>265±23</td>
<td>0.001</td>
<td>68</td>
</tr>
<tr>
<td>Time standing in the free stalls (min)</td>
<td>214±29</td>
<td>175±27</td>
<td>0.34</td>
<td>81</td>
</tr>
<tr>
<td>Time perching (min)</td>
<td>80±16</td>
<td>58±15</td>
<td>0.32</td>
<td>44</td>
</tr>
<tr>
<td>Time standing in manure alley (min)</td>
<td>93±20</td>
<td>32±3</td>
<td>0.001</td>
<td>44</td>
</tr>
<tr>
<td>Total time spent eating (min)</td>
<td>280±159</td>
<td>301±10</td>
<td>0.422</td>
<td>34</td>
</tr>
</tbody>
</table>

The percentage of cows lying down in free stalls with Foamats and free stalls with sand during the day and night is shown in Figure 2. After feeding in the morning at 07:00, 100% of cows were lying down in free stalls with sand while fewer cows were lying down in stalls with Foamats.

**Figure 2:** The percentage of cows lying down during the day and night in free stalls with Foamats (●) and sand filled (▲) free stalls.

In Figure 2 it is clear that cows preferred the sand bedding over the Foamats. Even though they were lying down for longer times on sand bedding, cows with access to Foamats were also getting a 12-hour daily rest.

**Conclusion**

In Experiment 1 cows were lying down for a longer period in free stalls with no wall in front than those with a wall in front. The total standing time for cows using free stalls with a wall in the front end was longer than for cows without the wall. For both types of free stalls more than 40% of the standing time was spent perching. In Experiment 2 cows were lying down for a longer period in free stalls with sand in comparison to stalls with Foamats. The cows also spent more time standing in the manure alley, in the free stall and perching in free stalls with Foamats. Cows were perching more in free stalls with Foamats than in free stalls with sand bedding. The three experiments showed that cows demonstrated a preference for stalls with more lunging space and sand bedding instead of mattresses.

**References**


Editorial Team

Petro van Rhyn (Editor)
021 808 5008
petrov@elsenburg.com

Dr Ilse Trautmann
(Chair: Editorial Committee)
021 808 5011
ilset@elsenburg.com

Gizelle van Wyk (Secretariat)
021 808 5022
gizellevw@elsenburg.com

Andre Roux
021 808 5010
andrer@elsenburg.com

Douglas Chitepo
021 808 5015
douglassc@elsenburg.com

Riaan Nowers
021 808 5194
riaann@elsenburg.com

Dr John Grewar
021 808 5056
johng@elsenburg.com

Maritjie Cornelissen
021 808 5497
maritjiec@elsenburg.com

Charnine Sobey
021 808 7614
charnines@elsenburg.com

Pavarni Jorgensen
021 808 5375
pavarnij@elsenburg.com

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