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## The World Animal Science News

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## EDITORIAL

### Research letter

***The reality of drought, consequences and mitigation strategies for livestock production in South Africa***  
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### Abstract

South Africa faced its worst drought in 2015 and as a result the livestock herds and flocks were under severe threat. This drought, linked to the heat waves and the reduction in breeding stock, will result in a shortage of livestock products for the next two to four years. A number of short and long term strategies are briefly discussed, whereas the importance of water is emphasized.

Keywords: climate, crops, global warming, heat  
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### The importance of water

Water plays a very important role in the physiology of the animal. Water is involved either directly or indirectly with essentially all physiological processes in an animal. It is the most critical factor in the diet of food animals. The feed consumption of animals is directly related to the water they consume. Drought (shortage of water) affects both the quality and quantity of feed.

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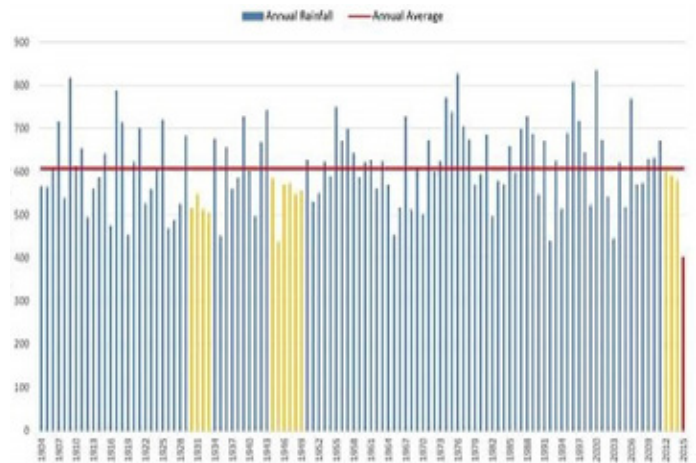
**Editorial (continues)**

During times of drought there is in most cases also periods of heat stress. Heat stress can affect the way livestock consumes feed (more night feeding) and the amount of water they drink, which can drastically increase. Water is used by livestock to regulate body temperature, by exhaling warm moisture-laden air from the lungs (sheep cool down this way as sweating is not an effective thermo-regulatory option for them).

Through the water that is lost by exhaling (sheep and cattle) or sweating (cattle) essential minerals are lost to the animal. These lost minerals will further exacerbate an already physiologically compromised animal and create a downward spiral (reduced production) and makes them vulnerable to disease and even death. It is therefore important that sufficient water is provided during hot periods, with the necessary mineral supplementation.

**The reality**

South Africa faced its worst drought in 2015 since 1982. This severe drought was ascribed to the combination of events such as regular climate dynamics, the presence of a super El Nino, and global warming. According to the South African Weather Service, 2015 was the driest year since recording of rainfall started in 1904. The average national rainfall in 2015 was approximately 400 mm compared to the long term average of just more than 600 mm. From 2012 to 2015, below average national rainfall was recorded for every year. As can be seen from Figure 1, it was only the third time since 1904 that below average rainfall was recorded in four or more consecutive years; the other two periods being from 1930 to 1933 and from 1944 to 1949.



**Figure 1** South Africa's total annual rainfall (mm) based on provincial rainfall data from 1902 until 2015 (South African Weather Service, 2016)

The 2015 drought was also accompanied by extreme heat and 2015 was the warmest year ever recorded. In Table 1 the number of heat waves and number of days on which heat waves were experienced (October to March) over the last 10 summer seasons are summarized (obtained from a presentation by Engelbrecht, C, unpublished). From Table 1, it can be seen that during the 2015/2016 summer season 12 heat waves, totalling 71 days were experienced.

**Table 1** Number of heat waves and heat wave days (October to March) over the last 10 summer seasons (obtained from a presentation by Engelbrecht, C, unpublished).

Season	Number of heat waves	Number of "heat wave days"
2006/2007	6	21
2007/2008	0	0
2008/2009	1	4
2009/2010	1	3
2010/2011	1	4
2011/2012	3	11
2012/2013	2	6
2013/2014	2	6
2014/2015	1	4
2015/2016	12	71

Projections show that in South Africa the interior temperature will rise by 2 to 3 °C by 2050 (Department of Environmental Affairs, 2010) and by 4 to 7 °C by the end of the century, if the release of greenhouse gases is not contained (Engelbrecht, et al., 2015). Furthermore, the rainfall will be much more variable (Lennard, et al., 2016).

### **Consequences**

Thousands of livestock have died or been culled due to the drought during the 2015 – 2016 season. Some farmers auctioned their livestock before they died and nearly a third more animals were slaughtered compared to the same time in 2014, mainly because of the drought. It is clear that South Africa's livestock were under severe feed and heat stress during the latter part of 2015 and this will affect livestock production in the years to come. The net result of the drought, linked to the heat waves and the reduction in breeding stock, will be a shortage of livestock products for the next two to four years.

Starving animals will mostly display pica behaviour. Rural communities should therefore be encouraged not to litter, especially with plastics to prevent the deaths of animals that could have otherwise been saved by providing feed supplements. The use of degradable, plant (cellulose) based packaging (bags, containers, nappies) should also be enabled/promoted/encouraged.

In the case of especially beef cattle, the fertility of the bulls may have been compromised. Heat stress is a common cause of reproductive inefficiency in mammals. Semen quality decreases when bulls are continually exposed to high ambient temperatures. Furthermore, it decreases sperm concentration, lowers sperm motility and increases percentage of morphologically abnormal sperm in an ejaculate. After a period of heat stress, semen quality does not return to normal for approximately eight weeks because of the length of the spermatogenic cycle, adding to the carry-over effect of heat stress on

reproduction. It is important to note that even only one day of heat stress may reduce semen quality and potential fertility

If bulls cannot increase the rate of heat loss from the body when they are exposed to elevated ambient temperatures, semen quality and potential fertility are reduced. It is important to note that in the South African beef production programs, eight weeks is essential for restoration of normal quality semen production after bulls are exposed to elevated ambient temperatures that cause heat stress, especially where fixed summer mating seasons are practised.

### **Animal health risks associated with drought**

Animals generally have a good idea of which plants are poisonous and how to avoid them. However, during drought conditions, animals will seek out and consume plants that they would under normal circumstances not find palatable leading to poisoning or even death. It is therefore, important to have knowledge of poisonous plants in the area where animals graze with a view to destroy or fence them off to protect animals during drought.

When dry and hot conditions persist as they did in the 2015 drought, there is usually proliferation of blue-green algae (Cyanobacteria) in standing water. Coupled with diminishing water volumes, animals are forced to drink such water, which is very toxic to the liver and nervous system.

Uncontrolled animal movement is another major risk that brings with it the potential to spread animal diseases. Farmers tend to allow their animals to roam far from home in search of feed and water resources resulting in mixing of animals from different areas. As a result, interaction between segregated populations such as wildlife and livestock increases because of the competition for scarce water and feed resources.

Internal parasitic diseases and incidences of pasturellosis can become a problem due to the animal's reduced immunity.

### **Short-term mitigation strategies**

A number of possible short term mitigation strategies are listed below.

i) During seasons of heat stress, a solution may be to make use of multi-sire breeding and/or to use of bulls from adapted (normally tropical) genotypes, to mitigate against possible male infertility.

ii) Introduction of alternative, more drought resistant crops which can provide grain sources for basal animal feeds such as sorghum. These alternative grains may be used in different forms of silage or balanced rations.

iii) Reduce animal numbers in order to manage stocking rates. This suggestion is easier to implement for both commercial and small holder farmers on privately-owned land, but rather difficult for livestock owners on communal land where decision-making regarding reducing stock numbers involves many owners who may not easily agree to the idea. The campaign to reduce stock numbers could be carried out jointly with government drought relief programmes (supply of feeds) where farmers could be required to agree to reduce stock numbers for eligibility to participate in incentive programmes.

iv) Every possible source of hay counts in this situation and the possibility of ammonization of some poor quality hay could be considered. For example, 27 kg of anhydrous ammonia per ton of straw will increase livestock performance and make it possible to use wheat straw as the only roughage in the diet, a practice that is not recommended for untreated straw.

v) Poor quality hay from across South Africa could pose a threat in the dispersal of weeds in grazing

lands. To reduce chances of introducing undesirable plant species that may come with purchased fodder, feeding must be restricted to specific locations on the farm.

vi) Livestock can eat other feedstuff besides hay. In fact, they will do well on many other types of feed such as shredded scrub and therefore consider feeding alternative feeds like shredded scrub (boskos) during droughts. This implies that bushes and the smaller branches of trees are shredded and used as animal feed.

vii) Since the drought is normally compounded by extreme heat, taking into consideration that hide texture and hair colour impact on animal thermal regulation and heat stress, farmers need to make sure that their livestock have access to water and shade, particularly the darker coloured and rougher textured animals.

viii) Livestock movement needs to be restricted, particular during the hot periods of the day. In addition, the movement of livestock when providing drought feed should be restricted as far as possible, since livestock that are allowed to move about a lot will unnecessarily expend energy, which is not productive and it places a burden on maintenance requirements.

ix) Provide feed at night during extreme heat periods. Livestock tend to consume more feed during the night during periods of heat. It is therefore important to ensure there is feed available during the night.

x) Vaccination against stress related diseases such as Pasturellosis must be given serious consideration in periods of drought.

xi) Control parasites and provide at least the same salt and mineral mixture during drought as during normal periods. Cattle under nutritional and heat stress are less resistant to parasites than under normal conditions.

xii) The social awareness of droughts as well as its effects and countermeasures should be improved. This can be done through training, brochures, leaflets, bulletins, internet, radio, television, newspapers, etc.

### **Long term strategies**

It is also important to develop long term strategies since the indications are there that South Africa will experience more extreme and variable climates as a result of global warming. Some of the possible long term strategies are briefly discussed below.

#### *The planting of drought tolerant crops*

Some of the drought fodder crops that can be considered for South Africa going into the future are oldman saltbush (*Atriplex nummularia*), spineless cactus (*Opuntia* spp.) and American aloe (*Agave americana*). They have relatively low water requirements per kilogram of dry matter produced.

#### *Alternative fodder production systems*

The feasibility of using “hydroponics,” also referred to as contained feeding systems, should be investigated as an alternative way to produce fodder in periods of drought. The University of the Free State is already busy with a review in this respect.

#### *The development of pastoral risk management and decision support systems*

Management and decision-making by livestock farmers would be greatly enhanced by the availability of risk identification/evaluation and decision support systems or early warning systems. The provision and development of databases based on sound research results should provide the necessary inputs for the development of risk management and decision support tools. This should include decision support tools whereby

the stock farmer can be informed in times of environmental risks (e. g. drought and/or floods) and extreme temperature (both high and low) so that the farmer can have time to employ strategies to minimize the negative effects.

#### *Breeding for animals and forage cultivars that are more drought tolerant*

Breeding strategies should be implemented for selection and breeding South Africa’s indigenous breeds to enhance their capacity to tolerate drought. In the case of the Afrikaner, for example, it developed in the drier areas and it has specific adaptive traits. The Nguni breed is known to be adapted to low input production systems. The breeding of indigenous livestock in government and research farms should be encouraged with the aim of distributing them to farmers. Research should also focus on breeding of drought tolerant animals using the latest genomics technology. Identification of genetic markers and genes for drought tolerance will be key in ensuring that this strategy is successful.

New forage, pasture cultivars and eco-vars with higher nutritive quality and tolerances to limiting conditions (low soil fertility, drought and low water availability, heat stress, etc.) and competition from other plants (weeds and mixtures), are needed to optimise the efficiency of utilisation of veld by livestock.

#### *Veld (rangeland) monitoring and management*

Environmentally sound management of livestock on different veld types is fundamental to sustainable livestock production. Veld monitoring and management systems are needed to help pastoralists maximise economic efficiencies in livestock production while avoiding negative impacts of severe droughts.

#### *Climate change*



More efforts should be devoted to research on climate change and its impact of livestock production so that appropriate mitigation strategies (i.e. nutritional/ration adaptations to reduce heat load) could be developed and implemented. One initiative would be to develop projections of future changes in heat stress in cattle under climate change, as well as medium-range and seasonal prediction models for heat stress in

cattle as an early warning system for farmers based on the temperature-humidity index, an internationally used parameter indicative of heat stress in animals.

*Sustainable drought relief strategies e.g. fodder bank establishment*

It is important that farmers develop sustainable drought relief strategies, since the indications are there that South Africa will experience more extreme and variable climates as a result of global warming. Fodder flow planning with alternative methods of feed preservation strategies also need to be developed/transferred to livestock farmers. This will help to relinquish farmers' dependency on government fodder-provision schemes or subsidies.

*Good Disease Management Strategy*

The use of effective vaccines where applicable, limiting wildlife/livestock interactions and a good surveillance and disease control programme are all essential in long term to mitigate losses in periods of drought.

### **Acknowledgement**

The authors acknowledge the inputs of Mr K-L. Leeuw and Mr M. Ratsaka to this research letter.

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## **FROM WAAP MEMBERS**

### **From the American Dairy Science Association (ADSA)**

#### Large Dairy Herd Management Conference

This ADSA conference was held from the 1st to the 4th of May, 2016, in the Conference Centre at Oak Brook, Illinois, US, with nearly 600 dairy professionals participating. They came from 29 countries and 36 US States. The conference objective was to meet the growing information needs of dairy farmers, service professionals and students worldwide by undertaking the publication of a third edition of "Large Dairy Herd Management" (LDHM) as an e-book. Dairy experts from around the world were selected to prepare and present chapter papers as a first step in creating the e-Book. Recordings were made of the conference presentations and are now

available for purchase from ADSA. More details are available at <http://www.adsa.org/Meetings/LargeDairyHerdManagement.aspx>.

#### Last ADSA annual congress

At the meeting that was held in Pittsburgh, Pennsylvania (USA), the Meeting attendance tops 1,900. As of the close of registration on Monday afternoon, a total of 1,902 participants have registered for the meeting!

#### Future ADSA annual congresses

The following ADSA congresses in the US are being planned for future years:

- Knoxville, Tennessee, 24-27 June 2018;
- Cincinnati, Ohio, 23-25 June 2019;
- Ft Lauderdale, Florida, 14 – 16 June 2020.

#### Benefits of ADSA e-Membership

ADSA e-Membership (<https://www.adsa.org/Membership/MembershipTypes.aspx>) is available through ADSA Global Partner organizations and to individuals who reside outside of the US and Canada. This electronic membership was designed for those who have an interest in dairy science, but may not have the time or budget to attend ADSA's meetings, or cost-justify full membership in ADSA due to a different area of specialization. At a 50% discount from ADSA professional membership dues, an ADSA e-Member receives:

- Electronic access to the Journal of Dairy Science, (and a paper copy, if desired, for an additional fee);
- Access to a treasure trove of Joint Annual Meeting symposia (synchronized recordings from 2003-2015, with more added each year);
- Access to searchable Joint Annual Meeting

abstracts for the period 1998-2015, with more added each year, plus ADSA annual meeting abstracts from 1935 to 1997, as well as ADSA divisional meeting abstracts;

· The opportunity to subscribe to S-PAC (Searchable Proceedings of Animal Conferences) at the ADSA member rate. The ADSA e-Membership rate is USD 55 and runs for 365 days from date of sign-up.

S-PAC (Searchable Proceedings of Animal Conferences) is the most comprehensive animal production and management conference proceedings database in the world. This unique collection of conference proceedings and presentations is a must-have resource for animal scientists, veterinarians, academicians, consultants and members of industry around the world. As of August 2016, 59 conferences have contributed 560 sets of proceedings, with new conferences and proceedings added every month.

#### ADSA YouTube Channel

One of the ways ADSA uses for sharing information with the public and members is its YouTube channel "ADSANews" (<https://www.youtube.com/user/ADSANews>). It includes a combination of original videos provided by the Graduate Student Division and others shared by members. ADSA provides a portal where information is available about dairy departments and clubs and other dairy topics. Currently, there are 38 videos included in eight "Playlists", such as: Dairy Departments, Dairy Foods, Dairy Management, Milk Quality, Antibiotic Use.

#### **From the American Society of Animal Science (ASAS) and the Canadian Society of Animal Science (CSAS)**

#### 2017 ASAS-CSAS Annual Meeting & Trade Show

The American Society of Animal Science and the Canadian Society of Animal Science will hold the

2017 ASAS-CSAS Annual Meeting & Trade Show in Baltimore, MD, USA, from July 8 to July 12, 2017. This is the inaugural year of the meeting, which will be entitled “Animal Science and Technology: Ensuring Food Security” and has 3 goals: 1) to present high quality, relevant science that links animal science and animal

agriculture, 2) to offer social events that will enhance networking and add a family feel to the meeting, and 3) to create a successful and sustainable new meeting model. Please find complete information on the event at: <https://www.asas.org/meetings/annual-2017/home>.

### **From the European Federation of Animal Science (EAAP)**

EAAP & Animal Task Force (ATF) Special Session: “Food integrity in the food chain: How can the animal production sector contribute?”

The EAAP & ATF Special Session during the next EAAP Annual Meeting in Tallinn aims to bring together animal science with practice of animal production and connect researchers, policy-makers, industry representatives and societal organisations. The session would like to engage discussion with farmers, food processors and industries, retailers, nutritionists, scientists, but also with the society on the expected and possible contribution of the primary sector, in collaboration with the whole food chain, to support the animal derived food quality approaches and integrity. The most important findings of the session will be discussed with a panel.

The outcomes of the session will be then discussed in more details during the ATF seminar, in Brussels, on October 26th 2017, where a large panel of European stakeholders will be invited. For further information on the event, please visit the ATF website.

### Vacant positions at EAAP Study Commissions

Like every year, EAAP is looking for enthusiastic scientists who want to participate to activities of the European network for animal science. EAAP has 11 Study Commissions, each of them dedicated to specific topics. Participating to the Study Commissions activities is very important for researchers of any age: 1. to bring expertise to the continental animal science organization, 2. to develop proper network of scientists and to learn from working together with colleagues from all over Europe, 3. to create synergies that will be useful for international projects and activities, and much more. To participate, candidates will have to submit their applications [http://www.eaap.org/wp-content/uploads/2017/06/Application\\_Form\\_EAAP.pdf](http://www.eaap.org/wp-content/uploads/2017/06/Application_Form_EAAP.pdf) that will be put forward to EAAP members for electronic votes and then all candidatures will be discussed at the Study Commissions meetings that will be held in Tallinn. Finally, based on the information coming from CVs, electronic votes and Study Commissions meeting reports, the Council and the General Assembly will appoint the right persons in the Study Commissions. The mechanism seems to be quite lengthy but it has been planned to ensure the highest transparency to the procedure. By now, EAAP only expects that you will submit your application!

Here are the available positions for this year:

<b>Study Commissions</b>	<b>Vacant Positions</b>
Nutrition	1 Secretary
Genetic	2 Vice Presidents
Cattle	1 President + 1 Vice President
Livestock Farming Systems	1 President + 1 Secretary
Sheep and Goat	1 President + 1 Vice President + 1 Secretary
Pig	1 Secretary
Horse	1 President + 1 Vice President



Physiology	1 President + 1 Secretary
Precision Livestock Farming	1 VP + 1 Secretary+ 1 Industry representative

[EAAP/CUP Workshop on Writing and Presenting Scientific Papers: places still available!](#)

Communicating science is as important to the scientific process as designing, conducting and analysing the experiment itself. The EAAP/CUP workshop “Writing and Presenting Scientific

Papers” (27 August 2017 within the EAAP Annual Meeting in Tallinn) focuses on essential techniques for effective writing and presentation of scientific information: reviewing sections of a paper, improving tables and figures, practising an oral presentation, and reviewing posters. The workshop has an active learning format, where each session consists of an informative PowerPoint presentation followed by a practical team work. For information on fees and registrations, please visit the [2017 EAAP Annual Meeting website](#).

### **From the Nigerian Society for Animal Production (NSAP)**

[NSAP announces its next annual conference](#)

The 42nd annual conference of NSAP was held from the 26th to the 30th March 2017 with the theme “Emerging challenges facing animal agriculture in Nigeria and the way forward” at Landmark University in Omu-Aran (Kwarra State in Nigeria). The conference brought together scientists, producers, extension specialists, educators, consultants, and companies with an interest in improving the animal agriculture in Nigeria. Moreover, two renowned Nigerian scientists were conferred with the prestigious fellowship award of the society.

### **Eggs seem to help young children grow taller**

An egg a day might help undernourished young children grow to a healthy height, according to a six-month study in Ecuador. Whether soft or hard-boiled, fried or whisked into an omelette, eggs appeared to give infants a boost. It could be a cheap way to prevent stunting, say researchers in the journal “Pediatrics”. You can read more about the study on [BBC News website](#).



### **Animal Breeding Benefits Farmers and Offers Food-Secure Opportunity for Mitigating Climate Change**

[Publicly available sheep genomes](#)

Improved ruminant genetics increase animals’ resilience to climate-related stresses, increases reproductive performance, and – in some countries – could achieve emission reductions of 11-26% per unit of product, according to a new practice brief written by scientists from the Global Research Alliance’s Livestock Research Group and the CCAFS Low Emissions Agriculture Flagship.

The brief summarises the state of the science in this area and provides implementation guidance for policymakers and investors. It describes how animal breeding can increase livestock productivity and

resilience to climate change, while also reducing greenhouse gas emissions intensity. It focuses on opportunities in developing countries, where the majority of the world's ruminant populations can be found.

The practice brief can be downloaded here: [http://globalresearchalliance.org/wp-content/uploads/2016/09/CSA-Practice-Brief\\_Animal-Breeding.pdf](http://globalresearchalliance.org/wp-content/uploads/2016/09/CSA-Practice-Brief_Animal-Breeding.pdf).

### **Improved Greenhouse Gas Inventories for Livestock Essential to Meet Paris Climate Agreement**

Researchers say that using advanced greenhouse gas inventory and accounting methods to monitor, verify

and report on emissions will be necessary for livestock to demonstrate that it is contributing effectively to

the ambitious goals of the Paris Agreement on climate change.

Scientists from the Livestock Research Group of the Global Research Alliance and the CGIAR Research

Program on Climate Change, Agriculture and Food Security (CCAFS) argue in a newly released brochure that

more accurate and robust information on greenhouse emissions and productivity from livestock, captured

through an advanced inventory system, will be essential if the sector is to contribute effectively to climate

and development outcomes. Read more here: <https://cgspace.cgiar.org/handle/10568/76520>.

### **New Master of Applied Genetics by Research (Aquaculture)**

The University of the Sunshine Coast (USC) is launching a new two-year Master's Program in Applied

Genetics by Research (Aquaculture) for international and national students. The program

combines a

coursework component with a research thesis. This innovative hybrid structure is unique in Australia as it

embeds the necessary advanced and hands on discipline training integrated with tailored courses in

quantitative and population genetics, reproductive biotechnologies, omics, applied statistics and bioinformatics, and analysis of breeding, genetic and genomic data. Applications for the first intake are now

open. Further information about the program structure, admission requirements and career perspectives

can be found at: <http://www.usc.edu.au/learn/courses-and-programs/postgraduate-degrees/master-of-applied-genetics-by-research-aquaculture>.

## **NEWS FROM INDUSTRY**

### **Nigeria Inaugurates Committee On Animal Genetic Resources**

The Nigerian National Biotechnology Development Agency (NABDA) has set up a [National Advisory Committee](#) to look into ways to improve local breed and control of animal genetic resources.

The committee was constituted in Abuja over the weekend, during a workshop on National Strategic Stakeholders Engagement on Animal Genetic Resources organised by the agency.

Inaugurating the committee, John Taiwo, the Acting Director of the Department of Animal Husbandry Services of the Federal Ministry of Agriculture, said the event became necessary as about 30 per cent of

animals slaughtered in Nigeria were imported from neighboring countries.

You can read more about the workshop on [New Horizon website](#).

## **FAO Support for WCGALP 2018**

FAO has made available funds to support scientists from developing countries to attend and present their work at the upcoming World Congress on Genetics Applied to Livestock Production, to be held from 11th to 16th February 2018 in Auckland, New Zealand.

Priority will be given to:

1. Scientists from Least Developed Countries;
2. Scientists working within their home countries and with local genetic resources;
3. Papers selected for oral presentations;
4. Participants who require only partial funding, particularly those persons with alternative funds for their flight ticket.

More details will be provided later, but at least you can start considering the possibility to submit a paper for the Congress or pass this information to your colleagues in developing countries. The submission deadline is 31 August 2017.

For more information, please contact Mr. Paul Boettcher: [paul.boettcher@fao.org](mailto:paul.boettcher@fao.org).

## **Canadian approval for insects in salmon feed**

Enterra Feed Corporation has received approval from the Canadian Food Inspection Agency (CFIA) to sell its Whole Dried Black Soldier Fly Larvae as a feed ingredient for salmonids, including farmed salmon, trout and arctic char.

With this approval, the company is now the first to market and sell this sustainable, natural product to aquaculture feed manufacturers in Canada. This is the first Canadian approval of an insect-based aquaculture feed ingredient, and follows the CFIA's approval using this same product in feed for chicken broilers last year.

Enterra received a similar US approval for use in salmonid feeds in 2016. For more information on this topic, please read the article on All About Feed website.



## **First insect farm in Saudi Arabia**

Insect producer AgriProtein has signed a deal with Saudi technology hub Sajt to build a commercial-scale production of insect-based animal feed in the Kingdom of Saudi Arabia.

Sajt will use AgriProtein's factory blueprint to build the first of three fly farms in Saudi Arabia, boosting food security and reducing reliance on imported feed. For more information on this topic, please read the article on All About Feed website.

If you wish to read further news on the insect industry, please visit the EAAP Insect Study Commission website.

## **Amino Acid Academy Workshop**

"Amino Acid Nutrition and Sustainability" is the title of a workshop jointly organized by Ajinomoto company and EAAP. Ajinomoto is a Japanese food and chemical corporation which produces seasonings, cooking oils, TV dinners, sweeteners, amino acids, and pharmaceuticals. The amino-acid production for animal use is the division of the company organizing this workshop with EAAP. The mission of such division of Ajinomoto is to provide products and services for animal feed additives with the best guarantee of safety.

for people and the environment. The title of the workshop is: **"Amino Acid Nutrition and Sustainability"**.

The workshop will be held in Paris on 28th and 29th September 2017. Further information and registrations will be available soon in EAAP website ([www.eaap.org](http://www.eaap.org)) and through the EAAP Newsletter.

## JOB OFFERS

### **PhD position available at University of Florida: "Breeding climate-smart beef cattle" (Gainesville, FL, USA)**

A PhD student position is available in the Department of Animal Sciences at University of Florida, to work in the area of beef cattle genetics and genomics. The work is funded by a USDA-NIFA Grant. The overall objective for this project is to reveal the genetic architecture of traits defining thermal tolerance using *Bos indicus* influenced cattle. For further information and applications, please read the [vacancy announcement](#) on [AnGenMap](#).

### **Assistant Professor in Animal Genomics at the University of Connecticut (Storrs, CT, USA)**

The Department of Animal Science in the College of Agriculture, Health, and Natural Resources at the University of Connecticut invites applications for a tenure-track faculty position in the area of Animal Genomics. The appointee will be required to develop an extramurally funded, innovative research program in any aspect of animal genomics. For further information and applications, please read the [vacancy announcement](#) on [AnGenMap](#).

## PUBLICATIONS

I. New articles have been recently posted on Feedipedia: **"NIR-based detection**

**of contaminants in food and feed"** (<http://www.feedipedia.org/content/nir-based-detection-contaminants-food-and-feed>), **"Feed additive strategies for replacement of antimicrobial growth promoters and a responsible use of antibiotics"** (<http://www.feedipedia.org/content/feed-additive-strategies-replacement-antimicrobial-growth-promoters-and-responsible-use>).

II. The FAO publication **"Probiotics In Animal Nutrition"** is now available as a PDF from the following link: <http://www.fao.org/3/a-i5933e.pdf>. Should you need a hard copy, please send a request to [Enrico.Masci@fao.org](mailto:Enrico.Masci@fao.org) with full postal address. Preference will be given to groups working in the area of probiotics and to the requests from libraries.

III. New technical articles have been recently published on Engormix: **"Water Quality Affects Drinking Preferences of Dairy Heifers"** (<http://en.engormix.com/MA-dairy-cattle/nutrition/articles/water-quality-affects-drinking-t39455/141-p0.htm>); **"Viral proteins expressed in the protozoan parasite Eimeria tenella are detected by the chicken immune system"** (<http://en.engormix.com/MA-poultry-industry/health/articles/viral-proteins-expressed-protozoan-t39605/165-p0.htm>); **"A rapid test for avian influenza detects swine influenza virus"** (<http://en.engormix.com/MA-poultry-industry/health/articles/rapid-test-avian-influenza-t39599/165-p0.htm>).

IV. Until December 11, 2016, the article **"State-of-the-art on detoxification of Jatropha curcas products aimed for use as animal and fish feed: A review Article"** will be freely accessible at the following link: <http://authors.elsevier.com/a/1TwKAlLwJlWXM9>. After this date, the full article can be requested from the author.

V. The article **"Proficiency Testing of Feed**



**Constituents: A Comparative Evaluation of European and Developing Country Laboratories and Its Implications for Animal Production**” is freely accessible to first 50 clicks at: <http://pubs.acs.org/doi/pdf/10.1021/acs.jafc.6b02452>. Should you not be one of the first 50 users to enter the above link, you may request the full article from the author.

VI. The new article **"Symposium Paper: Transportation Issues Affecting Cattle Well - Being & Considerations for the Future"** (published on The Professional Animal Scientist) details how a cattle transporter quality assurance program could help ensure the safe, humane and expeditious shipping of cattle and benefit the industry significantly in terms of both economics and efficiency. Read more at: <http://feedstuffs.com/story-certification-ensure-quality-welfare-during-cattle-transport-45-150007>.

VII. Recently, Nature Scientific Reports published a study on a very rare case of interspecies hybridization occurred between a ewe and a buck. **"Characterization of a very rare case of living ewe-buck hybrid using classical and molecular cytogenetics"** is freely available at: <http://www.aspa2.unitus.it/file/srep34781.pdf>.

VIII. **Six new papers on the ancient, complex and everlasting farm animal-zoonotic disease- human well-being nexus.** Six new open access publications on zoonoses, livestock and well-being have been recently released by scientists and partners of the International Livestock Research Institute (ILRI) and the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH). You can read and download them from [ILRI News website](#).

## MEETINGS AND CONFERENCES

### July 8th – 12th, 2017 in Baltimore, USA

#### *ASAS-CSAS Annual Meeting & Trade Show*

The American Society of Animal Science and the Canadian Society of Animal Science will hold the [2017 ASAS-CSAS Annual Meeting & Trade Show](#) in Baltimore, MD, USA, from July 8 to July 12, 2017. This is the inaugural year of the meeting, which will be entitled “Animal Science and Technology: Ensuring Food Security” and has 3 goals: 1) to present high quality, relevant science that links animal science and animal agriculture, 2) to offer social events that will enhance networking and add a family feel to the meeting, and 3) to create a successful and sustainable new meeting model. Please find complete information on the event [here](#)

### July 16th – 21st, 2017 in Dublin, Ireland

#### *36th International Society for Animal Genetics (ISAG) Conference*



The conference will take place in University College Dublin (UCD). The [2017 ISAG Conference](#) will provide an open and friendly forum for the sharing of knowledge between scientists and practitioners of animal genetics applied to economically important and domesticated species. The conference will comprise a series of plenary sessions, workshops organised by ISAG's standing committees, poster presentations, and a series of networking events. For further information on the conference and registrations, please visit [ISAG2017 website](#).



## July 18th – 19th, 2017 in Edinburgh, UK

### Precision Management of Grassland and Grazing Livestock Meeting



The meeting will be a satellite event of the European Conference on Precision Agriculture ([ECPA 2017](#)). Papers will be presented in the following areas:

- Pasture and soil monitoring technologies
- Smart nutrient management for grasslands
- Monitoring systems for grazing livestock
- Management of grazing animals

For further information on the meeting and registrations, please visit [ECPA 2017 website](#).

## July 24th– 28th, 2017 in Iguacu Falls, Brazil

### 54th Annual meeting of the Brazilian Society of Animal Science

The Brazilian Society of Animal Science (Sociedade Brasileira de Zootecnia - SBZ), founded on 1951, organizes every year its annual meeting and in 2017 it will be held at Iguacu Falls. Currently the society has over 3,000 members in Brazil and abroad. The society has a scientific Journal entitled "Brazilian Journal of Animal Science," published since 1973. This year theme of the annual meeting will be: "A new look at animal science: challenges and perspectives". The 2017 SBZ meeting will bring a group of renowned

speakers to discuss the new challenges for Brazilian animal production, focusing on the rational use of resources, meeting the growing demands on environmental and ethical issues, new markets and nontraditional arrangements for animal products, genetics and genomics, among other subjects. For further information, please visit [SBZ website](#).

## August 7th, 2017 in Aarhus, Denmark

### ISAE 2017 Satellite Meeting: "From beak to tail - mechanisms underlying damaging behaviour in laying hens and pigs"

This full-day meeting will be held within the [ISAE 2017](#) congress and will focus on two main themes: "Mechanisms underlying the link between health and damaging behaviour" and "Predisposing factors for damaging behaviour during early development". In addition, the meeting will include a networking session, with the aim to facilitate knowledge exchange and future cooperation between researchers working on damaging behaviour in pigs and poultry. For further information on the programme and venue, and on how to register, please see the "[Beak to Tail](#)" homepage.

## August 13th – 18th , 2017 in Cork, Ireland

### 63rd International Congress of Meat Science and Technology (ICoMST 2017)

The theme of the Congress will be how science can offer the meat production and processing sector solutions to enable it to nurture sustainably at local level while offering opportunities to grow globally. The conference aims also to provide a dynamic interface between academic research and innovative applications, and represents an important opportunity for everyone in the field of meat science. For further information and registrations, please visit [ICoMST 2017 website](#).

**August 28th – September 1st, 2017 in Tallinn, Estonia**

68th EAAP Annual Meeting (EAAP 2017)

The Organising and the Scientific Committees are delighted to announce that Estonia has been chosen as the venue for the 68th Annual Meeting of the European Federation of Animal Science. The meeting will take place from August 28th to September 1st, 2017 in Tallinn, Estonia's capital. The venue for the meeting will be Solaris Tallinn, located in the heart of Tallinn within walking distance from the city's best hotels and most iconic sights. EAAP 2017 builds on the success of previous EAAP meetings, and it will provide an excellent opportunity for scientists working with a wide range of animal species and in related disciplines to meet and discuss the latest developments in animal sciences. For registration and other information about the European animal science annual meeting, please visit [EAAP 2017 website](#).

**September 5th–8 th, 2017 in Wageningen, the Netherlands**

7th International Conference on the Assessment of Animal Welfare at Farm and Group Level (WAFL 2017)



WAFL is an international scientific conference on the assessment of animal welfare at farm and group level. It is organised once every three years, and following the successful meeting in Clermont-Ferrand in 2014, it will next be held from the 5th to the 8 th September 2017 in Wageningen, The Netherlands. With over forty oral papers divided

into six main sessions, and a great number of posters, WAFL2017 promises to give you the latest science from colleagues working in the field of animal welfare assessment! Please visit the WAFL2017 website for more information

**September 14th – 16th, 2017, in Skopje, Republic of Macedonia**

VII International Symposium of Livestock Production

The Institute of Animal Science of the University "SS. Cyril And Methodius" in Skopje organizes the "VII International Symposium of Livestock Production", which will be focused on the most significant achievements in the field of livestock production, as well as on the exchange of knowledge and experience in the agricultural practice. For further information and registrations, please write to: [iassymposium2017@gmail.com](mailto:iassymposium2017@gmail.com)

**September 18th – 21nd, 2017 in Port Elizabeth, South Africa**

50th South African Society of Animal Science Congress

Golden innovations for sustainable agriculture. All members of the association, managers, scientists, students and decision makers in the field of animal science are invited to attend. Please visit the website <http://www.sasascongress.co.za/index.html>

**September 19th – 22nd, 2017 in Johannesburg, South Africa**

13th African Dairy Conference & Exhibition (13th AfDa)

For more than a decade, the African Dairy Conference and Exhibition has brought the latest trends and developments in dairy, giving participants a deeper understanding of what is happening in the African dairy industry and the world at large. For more information and registrations, please visit the [13th AfDa website](#).

**September 20th – 22nd , 2017 in Hinxton,  
Cambridge, UK**

Conference: Animal Genetics and Diseases

The conference will be hosted by Wellcome Genome Campus and will bring together specialists working on the interface between genomics, genetic engineering and infectious disease with the aim of improving animal and human health and welfare. The meeting will showcase recent advances in genomics, genome editing, and mathematical techniques to understand disease resistance, pathogen evolution and vaccination success. For further information and registrations, please visit the [conference website](#).

**September 21st – 24th, 2017 in Chania,  
Greece**

8 th International Conference on Information and  
Communication Technologies in Agriculture, Food &  
Environment (HAICTA 2017)

[HAICTA 2017](#) aims to bring together professionals, experts and researchers working on Information and Communication Technologies in Agriculture, Food and Environment. It additionally aims to emphasize on the applicability of ICT solutions to real industry cases and the respective challenges. The Conference will take place from the 21st to the 24th of September 2017, in Chania (Crete, Greece). The event is co-organized by the Hellenic Association for Information and Communication Technologies in Agriculture, Food and Environment (HAICTA) and the Mediterranean Agronomic Institute of Chania (MAICh), in cooperation with several other Institutions. For further information on the event, please visit [HAICTA 2017](#) website.



**September 28th – 29th, 2017 in Paris,  
France**

Amino Acid Academy Workshop

**"Amino Acid Nutrition and Sustainability"** is the title of a [workshop](#) jointly organized by Ajinomoto Eurolysine and EAAP. Ajinomoto is a Japanese food and chemical corporation which produces seasonings, cooking oils, TV dinners, sweeteners, amino acids, and pharmaceuticals. The amino acid production for animal use is the division of the company organizing this workshop with EAAP. The mission of such division of Ajinomoto is to provide products and services for animal feed additives with the best guarantee of safety for people and the environment. The workshop "Amino Acid Nutrition and Sustainability" will be held in Paris on 28th and 29th September 2017. Further information and registrations are available on the specific [website of the workshop](#).

**September 28th – 29th, 2017 in Balotesti,  
Romania**

14th International Symposium of Animal Biology and  
Nutrition

The 14th International Symposium of Animal Biology and Nutrition will be held on September 28 - 29, in Balotesti, Romania and it is organized by the National Research-Development Institute for Animal Biology and Nutrition. The event gathers experts and scientist in biology and animal nutrition from all over the world, presenting their most recent research and current scientific trends.



The main topics of the 14th Symposium will be: Quality and safety of animal products; Low input / sustainable animal production systems; Genetic biodiversity, breeding and reproduction; Feeding efficiency & environment; Animal welfare. For further information, please visit the [symposium website](#).

**October 3rd – 5th, 2017 in Vitoria-Gasteiz, Spain**

*oint Seminar of the FAO-CIHEAM Network on Sheep and Goats: "Innovation for Sustainability in Sheep and Goats"*



The seminar, which will be held in VitoriaGasteiz (Spain) on 3-5 October 2017, will gather together the Subnetworks on Nutrition and Production Systems and it is jointly organized by Neiker-Tecnalia (The Basque Institute of Agricultural Research and Development), the Mediterranean Agronomic Institute of Zaragoza (IAMZ-CIHEAM), and the H2020 project "iSAGE" (Innovation for Sustainable Sheep and Goat Production in Europe), with the collaboration of the Food and Agriculture Organization of the United Nations (FAO). You can find the complete announcement of the event and all relevant information at the [seminar website](#).

**October 4th – 6 th, 2017 in Colonia, Uruguay**

*3rd Conference of Greenhouse Gas Emissions in Animal Agriculture Production Systems of Latin America (GALA 2017)*

The National Institute for Agricultural Research (INIA) of Uruguay is eagerly organizing the 3rd Conference of Greenhouse Gas Emissions in Animal Agriculture Production Systems of Latin America ([GALA 2017](#)). GALA 2017 will allow to share once more the scientific progress, the knowledge, and experience of colleagues from Latin America and from the rest of the world, strengthen the ambitious efforts of countries to combat climate change and adapt agricultural systems to its effects. GALA 2017 will have sessions on:

1. Quantification and mitigation of methane from agricultural systems;
2. Quantification and mitigation of nitrous oxide from agricultural systems;
3. Advances in GHG modeling;
4. Carbon footprint and Carbon sequestration.

For further information and registrations, please visit the [GALA 2017 website](#).

**October 16th – 19th, 2017 in Batu, Indonesia**

*6th International Conference on Sustainable Animal Agriculture for Developing Countries (SAADC 2017)*

The [6th SAADC Conference](#) will be held with the theme of: "Wisdom of Using Local Resources for Development of Sustainable Animal Production in Developing Countries". Besides providing a platform for researchers and industry stakeholders to share science and experiences for the development of sustainable animal agriculture in the developing countries, a major focus of SAADC is to provide assistance to young scientists to prepare high quality scientific papers to be presented and discussed in the SAADC conference program and then published in reputed international scientific journals. For further information, please visit the [conference website](#).

**October 18th – 20th, 2017 in Budapest, Hungary**

2nd World Conference on Innovative Animal Nutrition and Feeding



The AK Congress, which is a member of the Wolters Kluwer Group (The Netherlands), organizes the 2nd World Conference on Innovative Animal Nutrition and Feeding (WIANF) on 18th -20th October 2017 in Budapest, Hungary. EAAP is one of WIANF professional partners. The Conference aims to present how the latest developments of animal nutrition and related disciplines can be applied in animal nutrition to produce high quality and safe animal derived foods and to ensure production in a sustainable manner. For further information on the topics of the conference and registrations, please visit [WIANF website](#).

**October 25th – 27th, 2017, in Osijek, Croatia**

International Scientific-Expert Conference on the Preservation of Animal Genetic Resources

The conference is organized by the Croatian Agricultural Agency, the University of Zagreb, the Josip Juraj Strossmayer University of Osijek and the University of Zadar. It provides the possibility for verbal presentation, presentation via posters and the presentation of your institution/company or as a participant.

For further information, please read the [first notification of the conference](#) and visit the [conference website](#).

**November 16th – 17th , 2017 in Liège, Belgium**

Conference: Insects in feed or food?

The meeting will be held at the University of Liège, and will address questions such as:

- Should we eat insects or feed our animals?
- Could insects be useful in (veterinary) medicine?
- What can we learn from Southern countries? Are insects safe?

More than 10 leading experts in the field will share their most exciting research discoveries. For further information and registrations, please visit the [conference website](#).

**February 11th - 16th, 2018 in Auckland, New Zealand**

WCGALP meeting

The Organising Committee of the World Congress on Genetics Applied to Livestock Production is gearing up to the meeting in Auckland, New Zealand, that will be held in February 2018. WCGALP congress is the premier event for researchers and professionals involved in genetic improvement of livestock. Registrations are opened since December 2016. Call for papers opened on May 1st, 2017 and will close on September 7th, 2017. For more information, please visit the [congress website](#).



**May 15th – 20th, 2018, in Wuhan, China**

**2nd International Conference "Insects to Feed the World" (IFW 2018)**

The 2nd International Conference “Insects to Feed the World” aims to address all aspects related to insects as food and feed and will bring together research scientists, government officials and private sector representatives from the food and feed sector from both developing and developed countries. The overall objective of the conference is to further explore the potential of edible insects for food and feed security.

For more information, please get in contact with Dr. Longyu Zheng (Huazhong Agricultural University, China. Email: [ly.zheng@mail.hzau.edu.cn](mailto:ly.zheng@mail.hzau.edu.cn)), Dr. Arnold van Huis (Wageningen University, the Netherlands. Email: [arnold.vanhuis@wur.nl](mailto:arnold.vanhuis@wur.nl)), and Dr. Jeffery K. Tomberlin (Texas A&M University, USA. Email: [jktomberlin@tamu.edu](mailto:jktomberlin@tamu.edu)).

**September 3rd– 6th, 2019 in Leipzig, Germany**

**International Symposium on Ruminant Physiology**

The Symposium about Ruminant Physiology will be held in Germany in 2019 at the Kongresshalle am Zoo of Leipzig. The Symposium is the major international conference on ruminant physiology. It provides an overview of current, important scientific findings and areas of research in the physiology of ruminants of all kinds. For more information, please visit the [symposium website](#).



**"Everyone you will ever meet  
knows something you don't"**

**(Bill Nye)**

The **World Animal Science News** is the Official WAAP Newsletter. This interesting update about activities of the global animal science community presents information on leading research institutions in the entire world and also informs on developments in the industry sector related to animal science and production. The Newsletter is sent to all WAAP member organizations and to their associates. You are all invited to submit information for the newsletter. Please send information, news, text, photos and logo to [waap@waap.it](mailto:waap@waap.it).

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