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### EDITORIAL

#### **Do we need both extensive and intensive livestock systems for food security 2050?**

Over the last ten years the question of how much food will we require to satisfy the needs of a growing population and what would be the place of animal products in the diet has risen as one of the major questions to which Science and Agriculture are faced. The year 2050 was chosen to be sufficiently far in the future to decrease the pressure of immediate interests but close enough to allow modelling and potential transformations of our actual food systems. The very rapid rise in the human population that we have experienced in the last 50 years and the projections of fecundity to 2050 have led to an estimated 9.5 billion human beings at this future date. This is a situation never experienced in our global history and thus, the pressure of these actual food systems on the environment has never been so high. These projected changes are conducive to strong negative effects as a result from agriculture, especially effects on biodiversity, emissions of green house gases and pollutions of ground water, soils and air.

The question of what would be the place of animal products in the diet of humans in 2050 has been extensively studied by many groups of scientists. These studies have considered the effects of the actual diets that include animal products on human health and welfare as well as by the effects of livestock systems on the environment. Simultaneously, think tanks and groups of non-scientists approached this question to propose conclusions and directions which were more guided by philosophical or political positions, or were the result of manipulations of public opinion by multinational companies of the vegetal and energy sector, as well as other organizations (vegan and animal rights groups) with specific and unrelated objectives.

... Continues

## Editorial (continues)

How much animal products and how will we produce them in 2050 is a multifactorial question of incredible complexity which has multiple solutions, especially because we have developed a multitude of livestock systems over the globe, fitted both to global and local consumer markets and to the environmental conditions where the animals are raised. Nevertheless, as is the case in such complex questions, some simple facts arise from all the studies that I have modestly read on this subject. The first fact is that a complete vegan diet will not provide the expected results because we all need a minimal amount of animal products in our diet for human health, because the complete absence of livestock in agricultural systems will have profound and negative effects on soils and because livestock in many countries is an irreplaceable source of income and of reserves for small farmers. The second fact is that we already have the tools to reduce the footprint of our livestock systems on the planet: reducing methane emissions of ruminants by genetic selection and adequate feeding, closing Nitrogen and Phosphorus cycles in monogastric and polygastric animals, developing circular systems to dramatically reduce wastes are already feasible in most intensive systems.

So, the legitimate question is to know how will we face the huge demand in animal products, that FAO estimate to +70%, in 2050 simultaneously limiting their footprint on the planet?

Will we have to dramatically increase the efficiency of intensive systems already very productive in the places they are actually located? The answer is probably yes as this is an area where technical progress is continuing very rapidly. Genetic improvement will continue by using genomics, focusing on a better efficiency to transform feeds into foods while reducing footprint of these systems on both the local and global environment and maintaining the genetic diversity of the populations. Animal health will also benefit from progress in genomic studies of pathogens and hosts to continue to improve food safety, limit epizootic diseases and improve animal welfare which is currently

a challenge for these intensive systems. Animal welfare will also benefit from a better understanding of animal behaviour to develop intensive systems respecting the behavioural needs of animals.

Will these systems continue to be exported from the locations where they are historically implanted, essentially OECD countries, to developing countries where the majority of human populations will be located in 2050? The answer is also yes because such systems allow a better efficiency of retailing distribution in the country, because it prevents massive importations of animal products from abroad and because it provides local employment and services. However, it is also clear that these intensive livestock systems should not destroy the local economy, especially the local livestock systems which probably should be protected by new and efficient public policies, very different from the past when implantations were done without any limitations provoking complete disappearance of local productions.

Will we also need to protect and develop the efficiency of extensive livestock systems located all around the world in all countries? In my opinion, the answer is also yes for various reasons. The first one is because it represents the heritage of what our ancestors have developed over many centuries, even millenia. This priceless treasure is present in all countries and in quite all small regions of the entire world where farmers reside. Moreover, in each one of these countries, specific breeds have been selected for thousands of animal generations to produce that current population. This huge reservoir of biodiversity is a common good for all humanity, which owns not only to the offspring of local farmers who are its warden but to all other humans who may one day need specific alleles of interest. In contrast to plants, where seeds can be kept in deep-freeze, it is now known that preserving domestic animal biodiversity is only feasible and efficient if you simultaneously preserve the environment and the livestock system in which the animals are raised. But preserving these systems does not mean to freeze them for the future. The first key element for their preservation is that these extensive livestock systems should also integrate technical improvements aiming at limiting their footprint on the environment, even

though some of these technical improvements may be different from those of intensive systems. For example, selecting against methane emissions should be done at pasture; outdoor animal health should be preserved in spite of harsh conditions, etc. A second key element for their preservation is to improve their economic efficiency by helping them to produce high value products based on a strong demand from consumers. Sharing the historical, cultural and economical interest of these products with the citizens and consumers is certainly a challenge for the future of these extensive livestock systems.

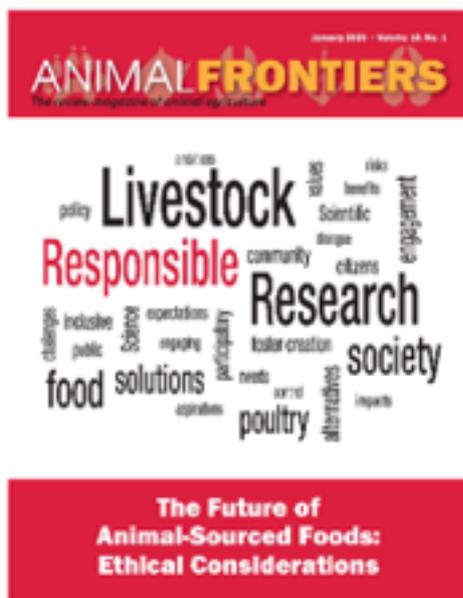
So, my answer is certainly yes, we will need both extensive and intensive livestock systems for food security in the year 2050.

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## From WAAP

### Animal Frontiers—January 2020 Update

by Deb Hamernik



The January 2020 issue of *Animal Frontiers* is titled “The Future of Animal-Sourced Foods: Ethical Considerations.” The ethics of animal production for the production of meat, milk, and eggs for human consumption is an increasingly discussed contemporary issue throughout the developed world. In this issue, ethics is considered mainly from a philosophical perspective and defined as the critical, systematic reflection on implicit and explicit moral assumptions of animal scientists. The papers in this issue follow a philosophical logic rather than a science-based approach to the topic.

The first paper (Caruana, 2020) provides a historical overview of ethical views on animals in various religions. Even though religions have many differences, our responsibility to animals is consistent across religions. Animal care is an obligation, both moral and religious.

Gremmen (2020) describes a Moral Operating System for the ethics of animal production systems. This Moral Operating System includes an internal professional care ethics, an external animal ethics, and an emergent ethics in life sciences that will enable change by responsible innovation.

Thompson (2020) describes ethical aspects of large-scale, concentrated animal feeding operations (CAFOs). Frequently cited welfare issues in CAFOs provide evidence for the need to reform animal care in these production systems; however, it is difficult to see how these conditions are equivalent to animal torture.

The next two papers (Francione, 2020 and Pulina, 2020) discuss the pros and cons of using meat. Francione (2020) argues that a sensible and coherent theory of animal rights should focus on just one right for animals—the right not to be treated as the property of humans. Pulina (2020) argues that consumption of meat is morally justified and that animals are not carriers of rights. People have specific obligations towards animals.

The next two papers (Shriver, 2020 and Bovenkerk, 2020) provide an ethical analysis of the relation between biotechnology and animal welfare. Shriver (2020) describes a Principle for the Conservation of Welfare and argues that this should be adopted to

ensure that genetic modification of food-producing animals does not result in unnecessary suffering for the animal. Bovenkerk (2020) argues beyond welfare and suggests that many people have moral issues with modified animals, regardless of whether or not the animal experiences welfare problems. There is less agreement on the arguments beyond welfare. Precision Livestock Farming (PLF) is an emerging system that may provide alternatives to conventional production systems; however, Werkheiser (2020) argues that PLF may have ethical concerns that have not yet been studied in-depth by scientists and not yet discussed outside academia.

For additional information on these topics, please visit the open access manuscripts.

- Bovenkerk, B. 2020. Ethical perspectives on modifying animals: beyond welfare arguments. *Animal Frontiers* 10(1):45-50.
- Caruana, L. 2020. Different religions, different animal ethics? *Animal Frontiers* 10(1):8-14.
- Francione, G.L. 2020. Some Brief Comments on Animal Rights. *Animal Frontiers* 10(1):29-33.
- Gremmen, B. 2020. Moral dilemmas of animal production systems. *Animal Frontiers* 10(1):15-20.
- Pulina, G. 2020. Ethical Meat, the respect for the farm animals. *Animal Frontiers* 10(1):34-38.
- Shriver, A. 2020. Prioritizing The Protection of Welfare in Gene-Edited Livestock. *Animal Frontiers* 10(1):39-44.
- Thompson, P.B. 2020. Philosophical Ethics and the Improvement of Farmed Animal Lives. *Animal Frontiers* 10(1):21-28
- Werkheiser, I. 2020. Technology and Responsibility: A Discussion of Underexamined Risks and Concerns in Precision Livestock Farming. *Animal Frontiers* 10(1):51-57.

## Ten Years of Animal Frontiers

Ten years ago, the American Society of Animal Science (ASAS), the European Federation of Animal Science (EAAP) and the Canadian Society of Animal Science established *Animal Frontiers* - a new international review magazine to present animal science position on issues of public interest and of importance for policy decisions. The American Meat Science Association joined the initiative soon after the establishment of the magazine. *Animal Frontiers* provides a novel forum for innovative, timely, and international perspectives that has relevance to understand the complex dynamics of high-impact, global issues at work through animal agriculture. The Management Board of *Animal Frontiers* just held a meeting hosted by EAAP in Rome, Italy, reviewed ten years of experience, themes and results of this new type of magazine and options for the future. At the meeting was defined the strategy for next ten years. In addition, it was decided to admit the World Association for Animal Production as a partner in this endeavour and to pass from four to six issues a year. It also recommended to the national member organizations of regional associations to translate the most interesting articles into national languages and to publish them in their respective publications so as to contribute to the better understanding of science based issues relevant to policy decisions.

### From WAAP Members

#### **American Dairy Science Association® (ADSA®)**

Updates from the American Dairy Science Association® (ADSA®)

I. Three major meetings will be held during the coming year. **The 2020 ADSA Annual Meeting** will be held June 21-24, 2020 in West Palm Beach, Florida. It is the most comprehensive dairy science meeting in the world. This global forum for professionals,

educators, and students will attract more than 1,800 dairy foods and production specialists. Over 1,100 presentations of cutting-edge research in all areas of dairy science from the lab to the farm to the table will be included as well as an exhibit area with 50 or more displays. The list of symposia is presented below. Networking opportunities abound throughout the meeting. For details [visit the website](#). To know which are the planned symposia at 2020 ADSA Annual meeting read [the attached document](#).

2. Two Discover Conferences will be held in 2020. The **38th Discover Conference - AUTOMATION IN THE DAIRY INDUSTRY** will be held May 11-13, 2020 at the Eaglewood Resort & Spa in Itasca, IL. The program will bring together researchers, industry partners, producers, and government to discuss current and future technologies and best management practices for success. More details are available on [the conference website](#). It will be followed by the **39th DISCOVER Conference - THE TRANSITION PERIOD - FROM PHYSIOLOGY TO MANAGEMENT** that will be held October 26 - 29, 2020 at the same location. This conference will focus on the scientific advancements made in the last 10 years and will discuss the unanswered questions and controversies about the transition period. The program will bridge from the fundamental science to its application. For more details visit the [conference website](#). An added bonus for attendees is that all receive 90 days of complementary access to the Searchable Proceedings of Animal Conferences.

3. One resource to know is the **ADSA Dair-e-news**, a free, weekly, electronic newsletter with information from the association and the dairy industry produced in cooperation with Feedstuffs. Please contact Ken Olson, Ph.D., PAS ([keolson@prodigy.net](mailto:keolson@prodigy.net)) if you would like to be included on the distribution list.

4. A search is currently underway for a new executive director to manage ADSA's programs and services. A bachelor's degree is required; an advanced degree,

particularly in science, is desirable. Leadership experience in a scientific organization and proven ability to manage headquarters office operations are desirable. A full position profile and application details are available at the [job vacancy webpage](#).

### **Animal Production Society of Kenya (APSK)**

#### **Joint XXIV International Grassland and XI Rangeland congresses**

The Joint XXIV International Grassland and XI Rangeland congresses will be held in Nairobi, Kenya, October 25 – 30, 2020. The theme of the Congress is "Sustainable Use of Grassland/Rangeland Resources for Improved Livelihoods". The aim of the congress will be to promote the interchange of scientific and technical information on all aspects of grasslands and rangelands: including grassland/rangeland ecology; forage production and utilization; livestock production systems; wildlife, tourism and multi-facets of grassland/rangeland; drought management and climate change in rangelands; pastoralism, social, gender and policy issues and capacity building, extension and governance. We look forward to seeing you in Nairobi in 2020. For more information, read the [attached flyer](#). For further information visit the [conference website](#).

### **South African Society for Animal Science (SASAS)**

#### **52nd SASAS Congress 2020: First circular**

The mission of the [South African Society for Animal Science \(SASAS\)](#) is to advance animal science and the animal science profession and promote viable animal production systems while sustaining natural resources and the environment, thereby enhancing welfare and wealth. The 52nd SASAS Congress will take place at the University of Pretoria during July 2020 (final date to be confirmed) under the following theme: "Communication of animal science: Is it reliable? Is it relevant? Is it responsible?"

There is a well-known saying that communication is key, but how many animal scientists really take that to heart when we discuss our business with the general public? Many modern-day consumers have little or no farming knowledge, but they care how their food is produced and don't always trust the information that is provided. This makes communication difficult. For example, how does one explain a perceived inhumane practice such as removing a dairy calf from its dam after birth, or branding and castrating beef calves, to someone whose opinion is based on imagining how they would feel in the animal's place? In addition, publishing a research paper in an academic journal often does not influence an audience beyond other professionals in the industry unless it is accompanied by press releases or social media posts aimed at the general public. It can be tempting to leave consumer communication to those with formal training or to a young intern who is comfortable with social media, but ultimately, the sustainability of the livestock industry is not only reliant on continuing economic and environmental viability, but also on social acceptability, and consumer acceptance can only be maintained and improved into the future by improving communication.

While it certainly is not necessary, or even possible, to satisfy each and every whim of every consumer, if we don't listen to consumer demands and either alleviate their concerns or adjust our systems accordingly, producers will run the risk of losing market share to other, more socially acceptable options, including plant-based foods.

This two-day congress will include excellent speakers from industry, academia, and the general public, so get ready for some lively debates. In addition, the poster session will showcase the latest local research from various research and educational institutions. The call for scientific abstracts will be circulated later this month 2020, so watch your inbox. In the meantime, to register your interest and/or add your name to the address list for future communication, please send your contact details to the congress coordinators at [sasasnorthernbranch@gmail.com](mailto:sasasnorthernbranch@gmail.com).

More information on the [dedicated webpage](#).

## **American Society of Animal Science (ASAS)**

### Call for Abstract 2020 ASAS-CSAS Annual Meeting and Trade Show

The abstract submission site for the 2020 ASAS-CSAS Annual Meeting and Trade Show is open! The deadline to submit an abstract is **Monday March 23, 2020 at 3:00 PM CDT**. Abstracts can be submitted for various categories and competitions. The Annual Meeting and Trade Show will be held in Madison, Wisconsin from 19 to 23 July 2020. Visit the [Annual Meeting website](#) for information on abstract submission and competition guidelines. [Book your housing](#) and compete your [meeting registration](#) today! Don't miss out on this great meeting and all the [Madison has to offer](#).

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

### 2nd Aminoacid Academy Workshop

Ajinomoto and EAAP are proud to announce that the 2nd Aminoacid Academy workshop will be held in Paris on November 23rd and 24th 2020. The workshop will have three sessions: "environment", "health & welfare" and "nutritional strategies" all of them from the protein and amino acid nutrition perspective. World-known invited speakers will share scientific papers and will effectively contribute to the dialogue between industry and scientific research. A specific website with the scientific program, detailed practical info and registration procedure will be published soon.

**Abstracts Submission is now open for the 2020  
EAAP Annual Meeting**

The online submission of the abstracts for the EAAP 2020 annual meeting to be held in Porto is open! All necessary information can be found [on the website](#). Please submit the abstracts of your research to participate to the largest and most exciting European animal science meeting. Some exciting sessions among the about 70 planned sessions are:

- Sustainable land use for healthy humans and a healthy planet
- Dietary methyl donor supplementation in dairy ruminants (EAAP/ADSA joint session)
- Climate change impact on livestock health and welfare
- Sustainable land use with equidae/Green services provided by equids
- Insect Genetics: opportunities and challenges

More information and more sessions are available at [the dedicated page](#).

**EAAP in Frankfurt**



"Matthias Gauly, President of EAAP, and Andrea Rosati, Secretary General, had a meeting with Reinhard Grandke (CEO of the German Agriculture Society - DLG) in Frankfurt . Andrea Rosati: "Looking forward to create interesting cooperation for the benefit of both groups: EAAP and DLG!""

**News from Science**

**Benefits of broccoli for broilers**



The feed industry is constantly seeking sustainable alternatives to antibiotics. Broccoli residues have valuable antimicrobial and antioxidant properties that make them an attractive alternative. [Read the full article on AllAboutFeed](#).

**Characteristics of traditional fermented yak milk**

A new research was accomplished by X. Fang et al. (Journal of Dairy Science, 2020, Vol. 103, pag. 191-200) from Lanzhou University (China) about the characteristics of volatile flavor components in traditional fermented yak milk produced in different ecoregions of the Qinghai-Tibetan plateau. The volatile flavor substances in traditional fermented yak milk samples collected from 5 ecoregions of the Qinghai-Tibetan plateau were comparatively analyzed. The relative percentage composition of volatile flavor substances varied among the different ecoregions. There were on average 65 to 78 types of volatile flavor substances, including hydrocarbons, sulfur-containing compounds, alcohols, aldehydes, ketones, free AA, and esters, in the traditional fermented yak milk samples collected from the 5 ecoregions. It was found that although the relative contents of volatile flavor substances in the samples varied among the different ecoregions, the samples collected from geographically close ecoregions had similar flavor substance compositions. The relative concentrations of the main volatile

flavor substances also varied among the different ecoregions. These variations might be related to the types of grassland and the composition of LAB in traditional fermented yak milk from the different regions.

### **Understanding the environmental impact of global dairy production**

Some popular press articles and social media discussions continue to cite the erroneous data presented in the “Livestock’s Long Shadow” publication (FAO, 2006). While this data has subsequently been shown to be incorrect there is an on-going discussion about the high level of impact of livestock on global GHG emissions for the last 15 years. There is inherent complexity in studying the biology of livestock for meat and milk production. Efforts to make this complexity more understandable can lead to incorrect assumptions and create an unfavorable and incorrect view of dairy and livestock production for the general public. An unfavorable image of animal production creates added challenge for dairy and livestock producers. If the general public is to believe information about the environmental impact of livestock production, it is critical that that information is both accurate and easily understood. A paper by Lisa A. Holden (Journal of Animal Science, Vol. 98, Issue 1, January 2020) highlights sustainable animal science and practices, GHG emissions and overall impact of dairy production on environmental sustainability. In order to continue to be sustainable, the paper states, a production system will need to make incremental improvements in efficiency at the individual farm level that keep businesses economically and environmentally viable. The complexity of the biology of the animal and of the production systems can benefit from the use of large datasets and a sound modeling approach to better understand the interrelated aspects of changes in the system. Further research will continue to improve modeling estimates and information for GHG emissions, water use, land use, social acceptability and other factors.

### **News from Industry**

#### **WHO: New guidance for human risk of AI**



The World Health Organization has released new guidance for humans handling birds that may be infected with avian influenza. It said that, given the spate of outbreaks in poultry across Europe since the end of 2019, it was important for people to take protective steps and to avoid contact with sick or dead birds or contaminated environments. [Read the full article on PoultryWorld.](#)

### **Job Offers**

#### **Postdoc position at the Centre of Agricultural Research and Technology of Aragón, Zaragoza, Spain**

We offer a 2-year postdoc position in the Department of Animal Production and Health of the Centre of Agricultural Research and Technology of Aragón, Zaragoza (Spain). The topic of the contract is “**Analysis of livestock agroecosystems: ecosystem services and simulation models for decision making**”. The postdoc will work in the ERANET-SUSAN project: *Animal Future: Steering Animal Production Systems towards Sustainable Future*, coordinated by [Dr. Alberto Bernués](#), and related projects developed by the Sustainable Livestock and Agrifood Systems research mixed group CITA-

University of Zaragoza.

The candidate should have wide knowledge of the 3 pillars of sustainability in livestock and mixed livestock-agricultural systems linked to the use of natural resources, as well as experience in simulation/ optimization models, valuation of ecosystem services, and farm-level systems analysis. Experience in EU projects and in international networks, and in writing scientific papers and grants will also be valued.

Contract starts 1-15 March 2020 (deadline for application **12th of February 2020**). The call in Spanish can be found [here](#). More information: Daniel Martin Collado: [dmartin@cita-aragon.es](mailto:dmartin@cita-aragon.es) (tlf: +34 976 716438)

### **Postdoctoral fellow at University of Missouri, Columbia, USA**

The [University of Missouri](#), division of Animal Sciences, is currently recruiting a postdoctoral fellow. Starting summer/fall 2020 there will be also a PhD position available to work on beef cattle puberty and fertility.

Postdoctoral researcher will mainly work on our large [USDA-funded project](#). Interested candidates should contact Jared Decker, either [by email](#), [phone](#) or [Twitter](#). Please include your CV and references. For more details read [the attached document](#).

### **SmartCow Postdoctoral position, at INRAE center of Theix, France**

A Postdoctoral position “Developping biomarker-assisted predictions of feed efficiency and N partitioning in cattle” is available at [INRAE](#) center of Theix, France within the EU Horizon 2020 [SmartCow project](#). Application deadline: **February 29th, 2020**

If interested send a motivation letter and a CV to: Gonzalo Cantalapiedra-Hijar ([gonzalo.cantalapiedra@inra.fr](mailto:gonzalo.cantalapiedra@inra.fr)) and Cécile Martin ([cecile.martin@inra.fr](mailto:cecile.martin@inra.fr)).

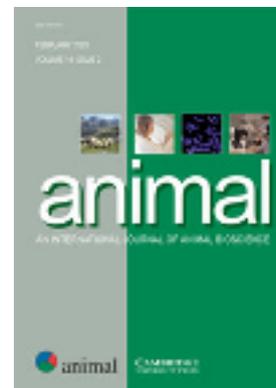
For more information about the position read [the attached document](#).

## **Publications**

### **I. Cambridge University Press**

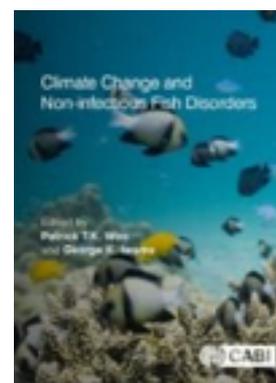
[Animal:Volume 14- Issue 2 – February 2020](#)

Article of the month “[Increased dietary protein for lactating sows affects body composition, blood metabolites and milk production](#)”



### **2. CABI**

[Climate Change and Non-infectious Fish Disorders](#). Patrick Woo, George K Iwama. December 2019. ([available for purchase](#))



**3. New technical articles have been recently published on Engormix:**

Animal Frontiers – October 2019 Update (By Deb Hamernik; Editor-in-Chief, Animal Frontiers)

I. “Poultry Gut Health”

II. “Relative Bioavailability of DL and L-Methionine in Broilers”

III. “The use of enzymes is profitable for producers and environmentally friendly”

IV. “A New Aquaculture Cooperative in Ohio”

V. “Effect of varying dietary crude protein concentration on performance and gut health in a necrotic enteritis challenge model”

**Meetings and Conferences**

**May 4th – 5th, 2020 in Brussels, Belgium**

**8th IDF International symposium on sheep, goat and other non-cow milk**

The 8th IDF International symposium on sheep, goat and other non-cow milk will take place in Brussels, Belgium on the 4 and 5 May 2020. For more information and registration please [visit the website](#)

**June 22nd – 26th 2020 in Vienna, Austria**

**FAO-IAEA International Symposium on sustainable Animal Production and Health**

The Symposium will be held in Vienna from 22 to 26 June 2020 and the objectives are to provide information and share knowledge on modern and novel technologies in animal production and health, and their application to support sustainable

livestock production systems. [For more information visit the website.](#)

**August 31st – September 4th 2020 in Porto, Portugal**

**71st Annual Meeting of European Federation of Animal Science**

EAAP is delighted to invite you to the 71st Annual Meeting. It will take place from August 31st to September 4th, 2020 in the world heritage city of Porto, Portugal. Detailed information can be found on [EAAP2020 website](#).

**September 28th – 30th, 2020 in Bled, Slovenia**

**Joint meeting EAAP Mountain Livestock Farming & FAO-CIHEAM Mountain Pasture**

The Joint Meeting of EAAP Mountain Livestock Farming Working Group & FAO-CIHEAM Mountain Pasture Sub-Network “Mountains are agroecosystems for people” will be hosted by the University of Ljubljana in Bled (Slovenia) on September 28th - 30th, 2020. Detailed information can be found in [this document](#).

**November 23rd – 24th, 2020 in Paris, France**

**2nd Aminoacid Academy Workshop**

The 2nd Aminoacid Academy workshop, organized by EAAP and Ajinomoto, will be held in Paris on November 23rd and 24th 2020. The workshop will have three sessions: “environment”, “health & welfare” and “nutritional strategies”. A specific website with the scientific program, detailed practical info and registration procedure will be published soon.

More conferences and workshops [are available on EAAP website](#).



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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