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**EAAP EQUINE SYMPOSIUM: KNOW-HOW AND FUTURE CHALLENGES FOR DEVELOPING THE HORSE SECTOR IN EUROPE: THE ACTIVITY OF THE EAAP HORSE COMMISSION**

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**0281 Recent aspects in stallion sperm preservation for artificial insemination.** M. Magistrini\*, *INRA, Nouzilly, France.*

Equine industry needs more and more to improve long-term sperm storage (chilled or frozen) to optimize artificial insemination (AI) and fertility rates and consequently genetic exchanges. In most domestic animal species, sperm extenders are composed of animal products such as milk and/or egg yolk (EY). However, these products are potential sources of bacterial contaminations and have a variable composition. In equine species, milk and egg yolk have been used for years in the composition of extenders. In our laboratory, we have decided to focus our research on the composition of extenders and our objective was to adapt extenders free of milk and or egg yolk for both chilled and frozen sperm. For chilled transported sperm, milk or milk based extenders have been used to dilute and store stallion sperm for AI. However, all milk components are not optimal for sperm protection. So milk fractions were tested and finally we developed an extender named INRA96, containing the purified fraction of native milk caseins, for long-term sperm storage at 4°C or 15°C. INRA96 is a ready to use extender and it can maintain fertility potential for up to 24–72 h. INRA96 has proved itself and many of breeders use it nowadays in many countries. Since the first insemination with frozen semen, the low or fluctuating fertility results have limited the use of this technology. Our objective was to develop a new freezing extender, easy to use and able to improve the success of artificial insemination with equine frozen semen. We first demonstrated that INRA96 extender, used previously for chilled transported sperm, supplemented with EY and glycerol significantly improved significantly the fertility rates of equine frozen sperm. More sterilized EY-plasma afforded the same protection as EY. These results lead to the commercialization of an extender available ready to use and called INRA Freeze. Our next objective was to identify the cryoprotective molecule(s) in egg yolk plasma. EY and more precisely LDL, composed mainly of phospholipids, have long been considered as cryoprotective agents. In our analytical approach to develop a new freezing extender, we have tested the effect of EY-phospholipids instead of EY or EY-plasma. Our results demonstrate that EY-phospholipids as cryoprotective agents are a promising approach that we have to finalize.

**Key Words:** Equine, INRA 96, sperm storage

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**0282 The growth of social sciences in equine research: Essential to create new understandings of the horse industry's growth and evolution.** C. Vial<sup>1</sup> and R. Evans<sup>\*2</sup>, <sup>1</sup>*INRA Montpellier, Montpellier, France,* <sup>2</sup>*Norwegian University College of Agriculture and Rural Development, Jaeren, Norway.*

The equine sector is currently growing and evolving worldwide. In Europe, it is estimated that there could be at least 6 million horses in the 27 member countries, grazing 6 million hectares of permanent grassland. 400,000 full time jobs equivalent would be provided by the sector and the numbers of horses and riders are growing in the approximate range of 7% a year. Today, little is known about the horse industry but there is a growing consensus that it has changed from a primarily agricultural and industrial sector activity to one firmly rooted in sports, leisure and consumption. It is impossible to understand these transformations without understanding the society within which they are embedded. Horse welfare, population size, behaviors and potentials depend on those of the societies in which their owners and riders live. Further, contemporary society is changing as it never has before. There is no single 'society.' Different peoples and different places all constitute unique economies, unique social values and mores, and unique formations of the horse industry. To understand the future of the horse sector we must understand these varied social and economic formations. In this context, and given the importance of and the challenges faced by the horse industry, the number of socio-economic studies devoted to this sector has recently multiplied all over the world. The social sciences undertake research, analysis and the development of new understandings of changes in the economy, in cultural values, and in social organization of contemporary society. Working together with traditional equine sciences, we are creating new interdisciplinary knowledge that helps us understand how we got to where we are now and where the equine sector might go in the future. That's why a working group in socio-economy has been created within the EAAP Horse Commission. Today, it includes 67 members from 20 countries. The goal of this group is to share ideas, research and experiences, but also to think about new topics of interest for research and development and to build common projects. This presentation addresses the social and economic issues faced by equine and social scientists who are exploring the contemporary shape of the equine sector, and whose research and analysis can help begin a discussion that enables us to understand what it might become in the future.

**Key Words:** equine, future of horse sector

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**0283 Equids contribution to sustainable development in Europe: Modern aspects and transfer of knowledge.** N. Miraglia\*, *Molise University, Campobasso, Italy.*

Sustainability as a concept comprises the combination of economic, environmental and social elements, never more importantly than when looking at the achievement of local sustainability. The achievement of sustainable development is not only dependent on the sustainability of the environment and its natural resources, but also on the level of economic and social conditions reached by the people using the environment and its natural resources. Europe's rural areas face significant challenges and, between them, the capacity to create sustainable development. In recent years there have been considerable worldwide changes in rural environment, agricultural and feeding systems that affected horse breeding considerably. Farming and forestry remain crucial as the use and the management of natural resources in the EU's rural areas. Rural development is the key tool for the restructuring of the agriculture sector and to encourage diversification and innovation. Equids match an important role in this context because they can make good, productive use of less-favored lands; they are able to develop considerable adaptation mechanisms to resist to very difficult climatic conditions and to low food availability. Diet selection needs to be analyzed to understand livestock performance and their impact on the vegetation in the different sites. So far, the studies concerning the integration between horses and territory are of considerable importance in the recovery of marginal lands and in maintaining their biodiversity. In this context grazing represents a major tool for conservation management because of its effects on habitat structure and biodiversity. Moreover, such activities are more and more linked to the maintenance of population in rural areas, to new relationships between citizen and cultural rural life and consequent preservation of traditional socio-cultural life. This paper will emphasize the role of equids in the rural development from past to future, identifying the farming systems in a general context of environment and landscape safeguard and of biodiversity preservation. It will emphasize the diversity of the "equine culture" and the equine-related activities such as leisure and tourism activities, the preservation of rural socio-cultural life and the most relevant socio-economic issues.

**Key Words:** equine, sustainability, rural development

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**0284 Genomic research in horses in Europe — EAAP Interstallion Working Group.** K. F. Stock<sup>1\*</sup>, L. Jönsson<sup>2</sup>, S. Mikko<sup>3</sup>, S. Brard<sup>4</sup>, B. Ducro<sup>5</sup>, S. Janssens<sup>6</sup>, and J. Philippson<sup>3</sup>, <sup>1</sup>*Vereingte Informationssysteme Tierhaltung, Verden, Germany*, <sup>2</sup>*University of Copenhagen, Department of Veterinary Clinical and Animal Sciences, Copenhagen, Denmark*, <sup>3</sup>*Swedish University of Agricultural Sciences, Department of Animal Breeding and Genetics, Uppsala, Sweden*, <sup>4</sup>*Institut National de la Recherche Agronomique (INRA), Génétique, Physiologie et Systèmes d'Élevage, Castanet-Tolosan, and Génétique Animale et Biologie Intégrative, Jouy-en-Josas, France*, <sup>5</sup>*Wageningen University, Animal Breeding and Genomics Centre, Wageningen, The Netherlands*, <sup>6</sup>*KU Leuven, Livestock Genetics, Department Biosystems, Heverlee, Belgium.*

With completion of the horse genome sequence in 2007, the potential of close international collaboration of researchers was impressively demonstrated, and an important step for genomic research in horses was taken. Since then, several European scientists have significantly contributed to the development of tools and strategies for using genomic information in the study of hereditary conditions and for improvement of breeding programs. An overview will be given of projects and initiatives in Europe in the field of equine genomics including prospected routine applications. Equine genetic and genomic research in Europe is carried by several strong and experienced research groups with high expertise and access to the latest methods and technologies, such as high-density SNP genotyping and next generation sequencing. The long standing European horse breeding organizations are in transition and have realized the potential of genomics for future practical horse breeding. Some progressive studbooks have accordingly shown considerable engagement and support in recent genomic projects. Because of their importance for the usability and overall quality of horses, health and performance have been and are still in the focus of genomic research in horses in Europe. Skeletal conditions are highly relevant for sport horses, so results of radiological screenings of young horses have been used for identifying ways to improve locomotory health by breeding. Quantitative trait loci have been identified and their routine use for selection purposes has been envisaged in, for example, Dutch, French and German horse populations for osteochondrosis, the most extensively studied single disease condition. Promising results for gaits and jumping have indicated the potential of using genomic approaches for improving complex performance traits in sport horses. However, limited accessibility of high-quality phenotype data has retarded the development of routine genomic applications in horse breeding, which is expected to significantly benefit from the recent initiatives addressing refinement and extension of the phenotypic information basis and R&D collaborations. The exchange of genetic material

between European Warmblood populations, the similarities of breeding goals and the relatively well developed infrastructure in the European horse sector make a good starting point for collaborative work across countries in the field of genomics.

Synergistic effects of linking national projects and resources are obvious and have allowed prospecting a joint European genomics project aiming at improved selection for health and performance traits in Warmblood horses.