Horse Commission H4.Session 24.7 miraglia@unimol.it

Equine Science Education in Italy

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Abstract

The paper will contain a synthesis of Horse Breeding and Horse Sport activities in Italy. Then, it will be presented the results of a survey(in progress) carried out in all the Italian research centres and institutions involved in equine research and education. A plan concerning a short description of the programs and of the research project will be presented together with the on line addresses and the name of the program leaders.

Key words: equine research, research centres, education

Introduction

In Italy the number of horses is of around 300.000 heads. The equine sector is managed by the Italian Ministry of Agriculture and Forestry, particularly by the UNIRE(Unione Nazionale Incremento Razze Equine - National Union for improving equine breeds) and by the AIA(Associazione Italiana Allevatori - Italian breeders association)(Fig.1). The UNIRE activity concerns, on one side, the administration of the stud book of thoroughbreds, trotters and saddle horses destined to equestrian sports and, on the other, the betting activity. In 2004 the total betting activity was of around three thousand million euros. A part of the income deriving from betting is destined to promote the breeding activity and to the different kind of prizes destined to breeders and to competitions(races, equestrian sports, etc.). UNIRE is also involved in activities concerning practical teaching to professionals and technical services in the field of antidoping, kinship controls and diagnosis of genetic diseases, pathological anatomy and legal medicine, experimentation of new molecules destined to sport horses(in cooperation with pharmaceutics industry)(UNIRElab). The AIA activity concerns mainly the administration of the stud book of Lipizzaner horses and of the rare Italian equine populations(horses, asses) at risk of extinction(Registry book); the AIA represents also the point of reference for the associations of the breeders of "Maremmano", Bardigiano, Haflinger and Italian draught(AITPR) horses: such associations administrate directly the stud book of their own breeds. In Italy there are a total of 44 associations involved in horses activities. In this context it was carried out a survey concerning the activity of the Italian research centres and institutions involved in equine research and education with the aim to have a clear imagine of the different degrees of equine research and equine education in Italy. At the end of the paper a list of addresses, web sites and e-mail addresses of the most important organizations and of the most important Italian researchers publications on equines in the field of horse management, reproduction and exercise physiology(these topics are generally widely discussed by the EAAP Horse Commission) will be available.

Material and methods

The results that will be showed below represent a synthesis of a survey carried out in all the Italian Veterinary and Agricultural Faculties, in some research centres, and in the most important organisations involved in horse activities. The survey schedule destined to Universities was divided into three parts:

- 1. Education(teaching activity in the field of horse management, reproduction and exercise physiology)
 - Courses integrated in the traditional education activity of the University
 - Specialised courses
 - Specialization school
 - Master
 - Practical teaching destined to student and to professionals
 - Congresses, Seminars, Workshop, Meetings
- 2. Research activity
 - Research programs
 - PhD
 - Publications
- 3. Most important professors and/or researchers involved in such activities Other information about equine science and education were collected for:
 - Research centres
 - Technical Organisations
 - Federations
 - Breeders associations

The schedule was referred to the last five years. All these data were collected together to constitute a data base concerning this field of interest. People interested to dispose of the complete data base can request it to Prof. Nicoletta Miraglia, Molise University(e-mail: miraglia@unimol.it).

Results

In Italy there are 14 Veterinary Faculties and 23 Agricultural Faculties. 9 Courses on Animal Production Sciences and Technologies are common to both veterinarian and agricultural faculties. The researches on animal production are carried out both in University and in some research centres; in this second case the most important research centres are the experimental zootechnical institutes(6 institutes). 61 Scientific associations and 46 specialized reviews are involved in the diffusion and in the vulgarization of experimental results. The survey evidenced that 11 Veterinarian Faculties are involved in equine science and education, while only 5 Agricultural Faculties have developed these kinds of activities. The geographical distribution of these Universities evidenced that the 64% of these University is concentrated in Central Italy(Emilia Romagna, Toscana, Umbria, Marche, Lazio, Sardegna and Molise Regions)(Fig.2). Between the experimental zootechnical institutes only 2(33%) is involved in equine researches. The research activity on horses is also carried out is some equine sport federations, mainly the Italian Federation of Equestrian Sports(FISE). The technical organisations such as UNIRE and AIA are directly or indirectly involved in equine science and education. The different equine sciences and education activities are listed below.

UNIVERSITY

The University were divided into 3 groups: leader, emerging and outsider. The leader universities have a strong tradition coming from many years of activity in equine science and education; they are: Torino, Parma, Bologna, Pisa, Perugia, Campobasso, Messina. The emerging universities are characterized by a considerable activities and interest in equine

studies and education, generally linked to the growing interest of the students on these kind of topics. These university are: Padova, Ancona, Bari, Sassari. The outsider universities, Teramo, Viterbo and Napoli, have recently developed activities in this field because of particular interests of single researchers.

LEADER UNIVERSITIES:

1. TORINO UNIVERSITY - Veterinary Faculty

Equine teaching: University courses(Horse Management, Nutrition, Exercise Physiology, Reproduction technologies and diseases, Equestrian Tourism)

PhD: Osteochondrosis in young horses

Congress activities: 5th Congress "New findings in equine practices", July, 2003

Most important research fields:

• Horse nutrition(nutraceutical, feeds digestibility)

• Endurance horses(functional evaluation of endurance horses)

University Web Site: www.veter.unito.it

Contact:

Prof. Domenico Bergero

Tel.: +39.011.6709207 Fax: +39.0116709240

e-mail: domenico.bergero@unito.it

2. PARMA UNIVERSITY - Veterinary Faculty

Equine Teaching: this University is the unique one having a University Course on Equine Sciences and Technologies(3 years program). The complete program was presented at the Bled EAAP meeting(Martuzzi et al., 2004)

PhD: Young horse management and development; Environmental and genetic factors affecting growth diseases

Most important research fields

- Growth curves and gaits in draft horses
- Horse Meat production
- Mare milk production

University Web Site:

www.unipr.it

<u>www.unipr.it/arpa/facvet/corsi/laureaste/Home</u> page.html(for information about the course)

Contact:

Prof. Antonio Lucio Catalano

Phone: +39.0521 902617 Fax: +39.0521 902611 E-mail catalano@unipr.it **Prof. Francesca Martuzzi** Phone: +39.0521 902616

Fax: +39.0521 902611 E-mail: martuzzi@unipr.it

3. BOLOGNA UNIVERSITY - Veterinary Faculty

Equine Teaching: University courses on horse management and health

Most important research fields

- Genetic characterization of local horse populations
- Role of nutrition on mare feeding and on athletic performances

University Web Site:

www.unibo.it

Contact

Prof. Adalberto Falaschini

Phone: +39 051.2097389 Fax: +39 051.2097373

E-mail falaschini@vet.unibo.it

4. PISA UNIVERSITY - Veterinary Faculty

Equine Teaching: University courses(Horse management: nutrition, management technologies, ethology, exercise physiology, behaviour and welfare, shoeing, horse health, regulations of studs and prophylaxis. Economy of the horse industry

Seminars: Horse Nutrition

Most important research fields

- Horse Nutrition(feeds digestibility, branched-chain amino acids)
- Exercise physiology
- Reproduction(embryo transfer, artificial insemination)

University Web Site:

www.unipi.it

Contact:

Prof. Domenico Gatta(horse nutrition – exercise physiology)

Phone: +39.050-3139427 Fax +39.050-313943 E-mail gatta@vet.unipi.it

Prof. Francesco Camillo(reproduction)

Phone: +39.050.31351 Fax +39.050.3135182 E-mail camillo@vet.unipi.it

5. PERUGIA UNIVERSITY - Veterinary Faculty/Study Centre of Sport Horses

Equine Teaching: University courses(Horse health and welfare), Specialization School(Animal welfare and management, including horses), Practical Teaching(destined to veterinarians)

PhD: Equine Sciences

Most important research fields

- Equine genetic(Performance Test for Italian saddle horses and for Maremmano Horses, Genetic and morphological index and DOD, Genetic index of Italian trotters, improving breeding technologies for Italian Saddle Horses)
- Horse Welfare

University Web Site:

www.unipg.it

Contact:

Prof. Maurizio Silvestrelli(Director of Study Centre of sport Horses)

Tel. +39.075.5854508 Fax: +39.075.5857764 E-mail: vete5@unipg.it

6. MOLISE(CAMPOBASSO) - Agricultural Faculty

Equine Teaching: University courses on horse management

Congresses: National Congress "New findings in Equine practices" (7 Editions)

Seminars: Horse biodiversity, exploitation of low productive areas by horses, asses milk production, structures for equine studs, morphological evaluation of horses and identification of coat

PhD: Animal Welfare and quality of animal productions(Horse Nutrition, Exercise Physiology, Asses milk production)

Most important research fields

- Horse Nutrition: feeds digestibility, nutrition of the young horse
- Forages: study of mediterranen forages, forages water holding capacity, silages techniques
- Exploitation of low productive pastures by horses
- Horse biodiversity
- Equidae's milk
- Milking machine for asses
- Horse meat
- Horse behaviour

University Web Site:

www.unimol.it

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Prof. Fabio Pilla(horse biodiversity)

Phone: +39.0874.404751 Fax: +39.0874.404855 E-mail: pilla@unimol.it

Prof. Giuseppe Maiorano(horse meat)

Phone: +39.0874 404819 Fax: +39.0874.404855 E-mail: maior@unimol.it

Prof. Donato Vito Casamassima(horse behaviour)

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E-mail: casamassimad@unimol.it

Prof. Andrea Simoni (milking machine for asses)

Phone: +39.0874.404969 Fax: +39.0874.404855 E-mail: asimoni@unimol.it

7. MESSINA UNIVERSITY – Veterinary Faculty

Equine Teaching: University courses, Master, Practical Teaching

PhD (Equine Physiology)

Most important research fields:

- Equine exercise physiology
- Horse Behaviour and welfare(Ethology Laboratory)

- Equine Biodiversity
- Equidae's milk

University Web Site:

www.unime.it

Contact

Prof. Giovanni Caola(Equine exercise physiology)

Phone: +39.090.3503580 Fax +39.090.356195 E-mail gicaola@tin.it

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e-mail: biagina.chiofalo@unime.it

EMERGING UNIVERSITIES

1. PADOVA UNIVERSITY – Veterinary and Agricultural Faculties

Equine Teaching: University courses(Horse management and nutrition), PhD (Improving equine genetical ressources)

Most important research fields:

- Equine Nutrition
- Reproduction(Artificial Insemination)
- Equine management

University Web Site:

www.unipd.it

Contact:

Prof. Roberto Mantovani(Reproduction)

Phone: ++390438272661 Fax: ++390498272633

E-mail: roberto.mantovani@unipd.it

Prof. Lucia Bailoni(equine nutrition and management)

Phone: +39 049 8272645 Fax +39 049 8272633

E-mail:lucia.bailoni@unipd.it

2. ANCONA UNIVERSITY - Agricultural Faculty

Equine Teaching: University courses on horse management and nutrition

Most important research fields

- Horse nutrition and management:
 - nutrition of the athlete horse
 - use of mineral supplements in young horse feeding
- Morphological and metabolic variations in the young trotter horse
- Exercise physiology
 - Modifications induced by training and diet in some exercise-related blood parameters of young trotters

University Web Site:

www.agr.univpm.it

Contact:

Prof. Maria Federica Trombetta

Phone: +39.071.2204927 Fax +39.071.2204858

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3. BARI UNIVERSITY - Veterinary and Agricultural Faculties

Equine Teaching: University courses(Veterinary and Agricultural Faculties) (Horse Nutrition,

Horse Management and training techniques)

PhD: Animal Production Seminars: equidae milk

Most important research fields

- Equidae milk production
- Milking machine for mares and asses
- Exercise physiology

University Web Site: www.uniba.it

Contact:

Dr. Francsco Pinto(equidae milk production)

Phone: +39.080.5442830 Fax: +39.080.5442822 E-mail: pintoff@hotmail.it

Dr. Barbara Padalino(exercise physiology)

Phone: +39.0805443919 Fax +39.0805443925

E-mail: b.padalino@veterinaria.uniba.it

Prof. Biagio Bianchi(milking machine for mares and asses)

Phone: +39.0805442940 Fax: +39.805442940

E-mail: biagio.bianchi@agr.uniba.it

4. SASSARI UNIVERSITY - Veterinary Faculty

Equine Teaching: Practical teaching on equestrian tourism

Seminars: The choice of horses destined to equestrian rehabilitation

Most important research fields

- Management of Sardinian Anglo-arabian horses
- Equestrian rehabilitation

University Web Site:

www.uniss.it

Contact:

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OUTSIDER UNIVERSITIES

1. TERAMO UNIVERSITY - Veterinary Faculty

Equine Teaching: Specialization school on horse medicine and surgery.

Seminars: stallion management *Most important research fields*

• Oxidative stress in saddle horse

Web Site: www.unite.it

Contact:

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2.TUSCIA(VITERBO) UNIVERSITY - Agricultural Faculty

Most important research fields

• Relations between morphological parameters of the sporting horse surveyed by mean of computer image analysis.

Web Site: www.unitus.it

Contact:

Dr. Paolo Negretti

Phone: +39.0761357076 Fax: +39.0761357434 E-mail: negretti@iol.it

3. NAPOLI UNIVERSITY(Federico II) - Veterinary Faculty

Equine Teaching: Specialization school on animal nutrition

Most important research fields

Equines in vivo and in vitro feeds digestibility

Web Site: www.unina.it

Contact:

Prof. Federico Infascelli Phone: +39.081.4421931

Fax +39081.292981

E-mail infascel@unina.it

RESEARCH CENTRES

As mentioned above the researche centres are represented by the experimental institutes for zootechnic productions. Nevertheless, only 2 of these centres are involved in equine research. They are:

- Experimental Institute for Animal Production(Istituto Sperimentale per la Zootecnia) Monterotondo(Roma)
 - Lipizzaner Horses(Copernicus Project on Lipizzan Horses)

Web Site:

www.isz.it

- Reproduction Technology Laboratory (Consorzio per l'Incremento Zootecnico-C.I.Z./ Laboratorio di Tecnologie della Riproduzione) Cremona, Prof. Cesare Galli.
 - Improving of cloning technique in horses and development of the first genetical application(2 cloned horses in 2003 and 2005: Prometea and Pieraz). In the case of Pieraz(endurance champion) the cells to clone were provided by the french laboratoty CRYOZOOTECH of Eric Palmer together with the aid of GENOPOLE, the bio-park of Evry(France) having the aim to preserve the genes of exceptional horses. Actually the genetic bank dispose of cells belonging to more then 30 equines, each of one exceptional for its aptitude: endurance, show jumping, dressage, eventing; the bank dispose also of cells belonging to horse and asses rare breeds with the aim to safeguard biodiversity.

Web Site: www.isz.it

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France (CRYOZOOTECH): Dr. Eric Palmer

Phone +33134844313 Fax +33134844788

Email contact@cryozootech.com

TECHNICAL ORGANIZATIONS

- UNIRE(Unione Nazionale Incremento Razze Equine) Italian Organization for Improving Horse Breeds, Rome
 - Teaching activity: UNIRE is involved in activities concerning practical teaching to professionals
 - -Technical services: antidoping, kinship controls and diagnosis of genetic diseases, pathological anatomy and legal medicine, experimentation of new molecules destined to sport horses(in cooperation with pharmaceutics industry)(UNIRElab).
 - Research activities: sometimes UNIRE is involved in funding university scientific research

Web Site:

www.unire.it

• AIA(Associazione Italiana Allevatori, Italian Breeders Association), Rome As mentioned above, the AIA activity concerns mainly the administration of the stud book of Lipizzaner horses and of the rare Italian equine populations(horses, asses) at risk of extinction(Registry book); the AIA represents also the point of reference for the associations of the breeders of "Maremmano", Bardigiano, Haflinger and Italian draught(AITPR) horses: such associations administrate directly the stud book of their own breeds. AIA has a wide regional diffusion: in fact there are 92 regional breeders associations that depend from it. There are also 7 Regional Studs having stallions belonging to cosmopolitan breeds and to local horse and asses breeds. These stud are located, from North to South, in the Regions Lombardia, Emilia-Romagna, Toscana, Sardegna, Campania, Puglia and Sicilia.

Web Site: www.aia.it

FEDERATIONS

• FISE(Federazione Italiana Sport Equestri, Italian Federation of Equestrian Sports), Rome

Most important research fields

- Methodological approach in pony evaluation(in cooperation with the International Equestrian Federation)
- Thermography and Thermometry of horse legs
- Kinematics, biomechanics and neurophysiology of sport horses
- Horse Welfare
- Horse transport
- Bioethic and legal medicine

Web site www.fise.it Contact:

Dr. Gianluigi Giovagnoli E-mail: vet@fise.it

Discussion and Conclusions

Given the small number of horses, Italy has developed, in the last years, a considerable activity in equine science and education, mainly of high level. The considerable diffusion of scientific congresses in all the European countries testifies the increase in the research activity. Many problems arise when scientific principles have to be introduced in practical field conditions: the results of the survey showed that there is a consistent lack in low level teaching(e.g., destined to breeders, riders, groom, etc.). The correct equine practices are not well known, as shown in previous papers(Miraglia et al., 2004). Also, the considerable diffusion of artificial insemination determined, mainly in the case of horses destined to equestrian sports, a considerable compromission of the breeding planning because the breeders decided itself the choice of the stallion(e.g., horses winning the olympic games) without reflect on the effective improving in performances. This aspect, common to many european countries, could determine, in the future years, a considerable reduction of biodiversity and all the negative effect derived from it, as it is well known. Consequently, the role of education destined to professionals, the role of University courses destined to horsmen(such as the Parma University course), or the implementing of the number of seminars and congresses concerning the practical aspects of equine practices, could determine a growing interest in young people working on horses.

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Figure 1. Organization of the equine sector in Italy

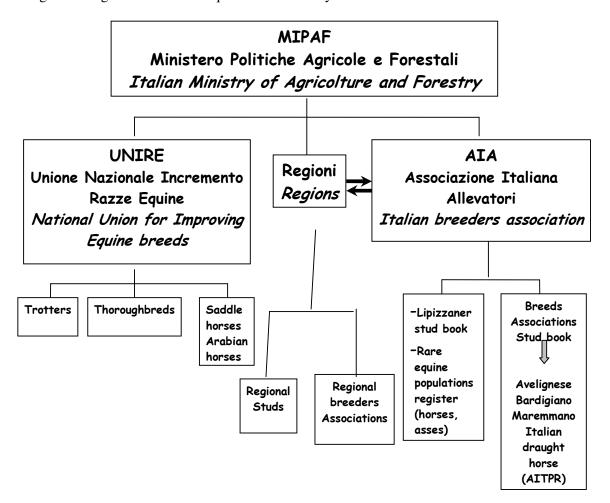


Figure 2 . Geographical distribution of the Italian University involved in Equine Science and Environmental



Annexed

List of the most relevant international publications of the last 5 years of the different research groups. Most of these publications comes from cooperations programs between different university: Torino and Campobasso, Torino and Messina, Campobasso and Messina, Ancona and Bologna, Sassari and Torino. The most important funding resources destined to these researches were obtained mainly by the available funds of each University; in alternative, funds came from the Italian Ministry of University and Scientific Research, from EEC funds(receipt by the different Italian regions) or from industries. The complete list of the publications of the different Authors(Italian publications) are available on the complete data base originated by this survey(ask to Prof. Nicoletta Miraglia).

TORINO UNIVERSITY

Bergero D., Miraglia N., Schiavone A., Polidori M., Meineri G., 2002. Effect of dietary LC – PUFAs and Vitamin E on serum oxidative status in horses performing very light exercise. Book of abstracts 53rd Annual Meeting of the European Association for Animal Production, Cairo, Egypt, 1-4 september 2002, 263.

Bergero D., Peiretti P.G., Cola E., 2002. Apparent digestibility of perennial ryegrass haylage ponies submitted at different level of work. Livestock Production Science, 77, 325-329.

ergero D., Miraglia N., Polidori M., Ziino M., Gagliardi D., 2002. Blood serum and skin ratty acid levels in horses and the use of dietary polyunsaturated fatty acids. Animal Research, 51, 157-163.

Caola G., Bergero D., 2002. Management of endurance horses. Book of abstracts 53rd Annual Meeting of the European Association for Animal Production, Cairo, Egypt, 1-4 september 2002, 272.

Assenza A., Bergero D., Tarantola M., Piccione G., Caola G., 2002. Blood serum branched chain amino acids and tryptophan modifications in horses competing in long distance rides of different length. Book of abstracts Joint Nutrition Symposium, Antwerp, Belgium, August 21-25, 2002, 78.

Assenza A., Arcigli A., Piccione G., Velis A., Bergero D., Caola G., 2002. Daily rhythms of blood serum concentrations of some neutral amino acids and serotonin in the horse – a preliminary study. Proceedings Biological Rhythms in Livestock. Messina, 14 ottobre 2002, 95-99.

Miraglia N, Bergero D., Polidori M., Peiretti P.G., Ladetto G., 2003. Effect of a new concentrate, rich in fiber, on horse rations digestibility. Book of abstracts 54th Annual Meeting of the European Association for Animal Production, Roma, Italia, aug. 31 – sept. 3, 2003, 418.

Bergero D., Assenza A., Schiavone A., Piccione G., Perona G., Caola G., 2003. Aminoacid levels in blood serum of horses performing long lasting low intensity exercise. Proceedings 7th Conference of the European Society of Veterinary and Comparative Nutrition, Hannover, 3-4 october 2003, 72.

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Piccione G., Assenza A., Fazio F., Bergero D., Caola G., 2004. Daily rhythm of vitamin D and of the calcium and phosphate in horse. Book of Abstracts 8th European Society of Veterinary and Comparative Nutrition Congress, Budapest, September 23-26, 64-65.

Bergero D., Miraglia N., Abba C., Polidori M., 2004. Apparent digestibility of Mediterranean forages determined by total collection of faeces and acid insoluble ash as internal marker. Livestock Production Science, 85, 235-238.

Bergero D., Assenza A., Caola G., 2005. A contribution to the knowledge of the physiology and metabolism of endurance horses. Livestock Production Science, 92, 167-176.

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Bergero D., Assenza A., Schiavone A., Piccione G., Perona G., Caola G., 2005. Amino acid concentrations in blood serum of horses performing long lasting low intensity exercise. Journal of Animal Physiology and Animal Nutrition. 89, 146-150.

PARMA UNIVERSITY

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Summer A., Tirelli A., Formaggioni P., Martuzzi F., Mariani P., 2003. Variation of mare milk nitrogen fractions: distribution of the main whey-proteins in relation to lactation stage. Proc. Annual Meeting European Association for Animal Production, LIV, 404.

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