Buffalo Newsletter

Number 30 – December 2015

BULLETIN OF THE FAO-ESCORENA INTER-REGIONAL COOPERATIVE RESEARCH NETWORK ON BUFFALO AND OF THE INTERNATIONAL BUFFALO FEDERATION – INCLUDES SHORT COMMUNICATIONS, RESEARCH PAPERS, TECHNICAL NOTES, ONGOING RESEARCHES

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Buffalo Newsletter - Number 30 - December 2015

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THE JAPAN BUFFALO DEVELOPMENT

The idea of Dr. Takashi Shirai of the Lake District Dairy Ranch, with the support of the Department of Hokkaido of Ministry of Agriculture and of the Obihiro University of Agriculture and Veterinary Medicine, is to develop the Buffalo Livestock in Japan, to develop also the market of local products, coming from buffalo.

The project is applicable particularly in Hokkaido isle, where the Agriculture is more diffused in comparison with other islands, even if the climate is more cold, with the snow during the winter months.

For this purpose Prof. Antonio Borghese was invited in Hokkaido by Takashi Shirai on January 2015 to expose the proposal of a project for the development of buffalo in Japan.

A meeting was organized on January 31 at the Congress Palace in Obihiro city with the participation of many Authorities of Ministry of Agriculture, Universities, private Companies, livestock farms, cheese industries, the Westlands Institute of Northeastern Asia, the Hakone Farm Co.LTD, the Hokkaido Tokachi Area Regional Food Processing Technology Center, and the Tokachi Livestock Hygiene Service center.

Prof. Borghese explained that buffalo species *Bubalus bubalis* is a very common species with a population of about 200 million head, particularly widespread in tropical and subtropical countries with hot and humid climates, but he showed a great capacity of adaptation in the cold climates too, as happened in Romania, U.K., Canada and Germany.

Prof. Borghese said that Japan has potential resources to develop dairy industry for both cow and buffalo to meet its domestic demands. Meanwhile, the introduction of the buffalo species, and in particular the Mediterranean Italian Breed, can achieve the goal to introduce a new industry in the milk and in the meat line in Japan market, according the previous experience made in Italian market, where mozzarella and other cheeses, ricotta, yogurt and other products from cheese industry, as well salami, bresaola, sausages and other products from meat industry are very much required by the consumers.

To achieve the best results in economic terms, a Buffalo Research Center will be created and the intensive system or semi-intensive system will be applied, according the models realized in Italy.

As the inherent pattern of reproductive-productive performance affects the level and sequence of milk production, the systems of semi-intensive and intensive herd management will be adopted and the modern husbandry techniques should be applied**.**

The project will start with the constitution of a Pilot Centre in Hokkaido, in an area where buffalo livestock could be an important reality. We will find the best 200 Mediterranean Italian buffalo cows for production and reproduction efficiency that will be host in the Pilot Centre.

Another possibility will be to buy Swamp animals, very cheaper than Mediterranean and more adapted to climatic and environmental conditions of Japan, and after to apply crossbreeding with Mediterranean Italian semen.

Purpose of the second proposed breeding schemes is to produce F1 and backcross buffaloes from swamp and river buffalo to be used to increase buffalo milk production in Japan while maintaining and improving a nucleus of purebred swamp buffaloes.

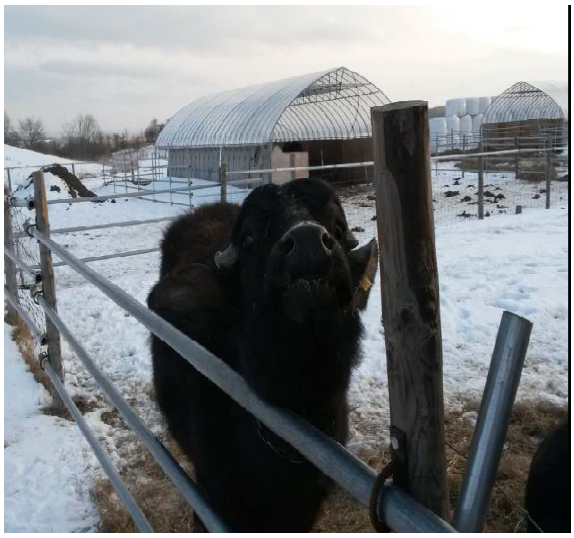
In both the hypothesis the nucleus of purebred buffalo will be recorded for milk productivity so to define the optimal breeding strategies to increase milk production until a level of 3000-3500 kg milk in 270 days of lactation.

If we will start from Mediterranean Italian the result is guarantee soon. If we will

start with Swamp or with River not selected for dairy purposes as we can find in Asia or in Australia we need to apply crossbreeding to achieve high production levels.

After the presentation, a vivacious discussion followed with many questions about Livestock, buffalo management, quality of products, market and economy.

Takashi Shirai



Visit in the Lake District Dairy Ranch and final dinner.

International Symposium on Dairy Animal Reproduction (ISDAR 2015) held at UVAS, Lahore, Pakistan

A two-day International Symposium on Dairy Animal Reproduction with the theme "New knowledge new practices" began at the University of Veterinary and Animal Sciences Lahore on March 30-31, 2015.

Lahore University of Management Sciences (LUMS) Pro-Chancellor Syed Babar Ali inaugurated the symposium organized by the Department of Theriogenology of the UVAS in collaboration with the Society of Animal Reproduction Pakistan (SARP).

Vice-Chancellor Prof Dr Talat Naseer Pasha, UVAS Ex-Vice-Chancellor, and SARP Patron-in-Chief Prof Dr Manzoor Ahmad and Prof Dr Laeeq Akbar Lodhi were present on the occasion. Plenary lectures, poster contest sessions, presentations and group discussions covering the areas of animal reproduction, animal health, nutrition and breeding and genetics are featuring the symposium.

This event has attracted a large number of national and international experts related to dairy animal reproduction from USA, Canada, Brazil, India, Turkey, Nepal, Afghanistan and Pakistan. Speaking on the occasion, Syed Babar Ali said that such symposium is very important for genetic improvement and development of local breeds.

The livestock sector is a rapidly growing sub-sector and central to the livelihood of rural people. He said that it is playing an important role in national food security and rural economic uplift and can play a more vibrant role in economic development, employment generation and socio-economic stability of rural areas provided a level playing field is available to its stakeholders.

He said that it is a stark reality that livestock sector based on modern reproductive techniques in our country is in infancy and there is a lot of space for modern research based inputs.

This is the time for our scientists to step forward and pave the path for sustainable development. He urged the professors and scientists to look into the future strategies to improve livestock productivity and health by the application of modern reproductive techniques.

Prof Pasha said that the purpose of the symposium is to involve the livestock stakeholder for their inputs in order to achieve faster, better and shared development leading to economic gains at the same time fulfilling the consumers and importers requirements.

Future road map has the milestones in the shape of entering the global Halal Food Market with credible veterinary certification, controlling trans-boundary animal diseases of trade and economic importance.

A number of stalls of various companies were set up at the symposium. Prof Dr Nasim Ahmad who was the organizing secretary of the Symposium accompanied Vice-Chancellor Prof Dr Talat Naseer Pasha, delegates and guests who visited many stalls and talked to stall owner asking about their products. Pre symposium workshops were also organized on "Recent advances in embryology and Bovine reproductive ultrasonography". In the afternoon participants visited Buffalo Research Institute (BRI), Pattoki for Milk completion (Doodh Mela).

Abstracts of ISDAR 2015 have been published in Pakistan Journal of Veterinary and Animal Science and are available at

http://jvas.com.pk/title/sup-isdar.asp

International Delegates from Turkey, Brazil, USA, and Nepal visited Milk Competition at Buffalo Research Institute, Pattoki

Concluding session of the Symposium

Buffaloes taking part in the Milk competition at Buffalo Research Institute, Pattoki

International delegates from India, USA, Canada, Brazil, Nepal, Afghanistan, Turkey along with Prof. Talat Pasha, Vice Chancellor, UVAS, Lahore

Participants of the Symposium during the inaugural session

The 8th Asian Buffalo Congress, Istanbul, 21-25 April 2015

The 8th Asian Buffalo Congress was held in Istanbul with the cooperation of Istanbul Provincial Buffalo Breeders Union, Namik Kemal University, Ministry of Food, Agriculture and Livestock and the Asian Buffalo Association. The 8th Asian Buffalo Congress was held in Istanbul between 21-25 April at Harbiye Military Museum and Cultural Center with 205 participants, 116 of them coming from 26 different countries.

At the 8th Asian Buffalo Congress had participated:Food , Agriculture and Livestock Ministry Undersecretary Dr. Nihat Pakdil, Istanbul Deputy Governor Osman Günaydın, Istanbul Provincial Food, Agriculture and Livestock Director Hamid Aygül, the 8th Asian Buffalo Congress President Prof. Dr. M. Ihsan Soysal, Istanbul Provincial Stud Buffalo Breeders Union Chairman Sezai Ural, Stud Buffalo Breeders Center President Hüseyin Yilmaz, Head of big ruminants Breeding Research Coordinatior Önder Sözen and sector representatives.

On Wednesday April 22nd, the 8th Asian Buffalo Congress President, Prof. Dr. M. Ihsan Soysal made the opening speech to the congress, in his speech he thanked all of the guests for the high participation to the event and touched upon the importance of having the buffalo congress in Turkey, the country's experience of scientific research on the subject and stressed the importance of sharing the experience.
Soysal pointed out that the Asian Buffalo Congress is organized every two years and thanked Food, Agriculture and Livestock Ministry for their support, he also stated that as a result of their cooperation with other representatives of the sector, they have carried out various studies on productivity both in the field of other animals as well as buffalos.

During his speech, Food , Agriculture and Livestock Ministry Undersecretary Dr. Nihat Pakdil stressed that they are continuously in cooperation with the sector representatives and also stated “Livestock is an area where we make positive discrimination. This is why important developments were reached.”

Regarding the subject, Istanbul Provincial Buffalo Breeders Union Chairman Sezai Ural stated : At the congresses up until now, experts from around the world have examined every aspect of the subject in the light of long-term projection and scientific research. It is important that in Thailand where the last congress took place, the decision of Turkey hosting the 8th congress was made. Turkey is one of the countries who has the power to take voice and to determine policies regarding buffalo.
After the Opening Ceremony, two main lectures were presented in plenary session.

The first one by Prof. Antonio Borghese, the General Secretary of the International Buffalo Federation, with title “Buffalo recording, udder physiology and milkability as factors of milk availability in the world economy”, presented the most important dairy purpose breeds in the world and the effect of the animal recording on

the genetic improvement, their milk products and different markets. He focalized the importance of udder anatomy and physiology and their effects on milkability, the ability to give a regular, complete and rapid milk secretion by the mammary gland in response to a proper milking techniques.

The second one, by Dr. John Williams, Parco Tecnologico Padano, Italy, on "Recent advances in buffalo genomics", where he showed as several buffalo of different breeds have been sequenced and comparison of these sequences identified millions of sequence variants. A 90K panel of single nucleotide polymorphism (SNP) covering the buffalo genome was developed based on allele frequencies within and among buffalo breeds, to investigate the structure of buffalo population and the genetic diversity of river and swamp buffalo and to localize genes that are of relevance for production traits.

After that the work followed in two different sessions, genetics and diseases.

In the afternoon of April 22, in plenary session, Prof. M. Ihasan Soysal, Department Animal Science of Faculty of Agriculture in Namil Kemak University, Turkey, presented "Anatolian water buffalo husbandry in Turkey", where a population of about 122,000 Anatolian buffaloes is present. He showed the results of the new Based Anatolian Buffalo Breeding project on 25,000 buffaloes in 16 provinces, where the lactation yield was 852 kg, 952 kg and 987 kg respectively in the years 2012, 2013, 2014.

The lecture by Dr. Inderjeet Singh, ICAR Central Institute for Research on Buffaloes, Hisar, India, on India's rich and diverse buffalo germplasm for global buffalo development, followed. He presented the different breeds, their performances and the results of crossbreeding experiences in India, where the buffalo population is represented by 108 million head, 56.9% of total population.

The congress followed in separate sessions.

The day after, April 23, was opened with the main lecture in plenary session by Prof. Rangsun Parnpai, Institute of Agricultural Technology, Suranaree University of Technology, Thailand, on the State of art of reproductive biotechnology in buffaloes. He showed the recent advances in estrus synchronization, MOET, IVEP, embryo sexing, somatic cell nuclear transfer or cloning.

Another main lecture was held in the afternoon by Prof. Talat N. Pasha, University of Veterinary and Animal Sciences, Lahore, Pakistan, on Nutritional Interventions for economical milk and meat production in buffaloes, were the strategies for forage conservation, improving the nutritional quality of low quality crop residues, evaluation of digestibility and reducing the nutritional cost, were discussed.

The all day was very intensive with lectures and posters organized in different sessions.

Friday April 24 started with plenary session and the main lecture by Kehuan Lu, Guanxi University, Nanning, China, on" Buffalo reproductive biotechnologies: the current status in China", where the results of applied biotechnologies in China were described, with the purpose of increasing the poor milk production of Swamp buffalo (about 600 kg per lactation) and to meet the demand of beef and dairy industry.

Many lectures were presented after that in separate sessions.

In addition to our main congress, a "Buffalo Reproductive Biotechnology" themed workshop was organized between 19-20 April 2015 headed by Prof. Dr. Serhat Alkan from

The Veterinary faculty of Istanbul University. Keynote speakers and educators from Bulgaria, Pakistan and Italy who are experts on the subject 'artificial insemination of buffaloes' participated in the workshop.

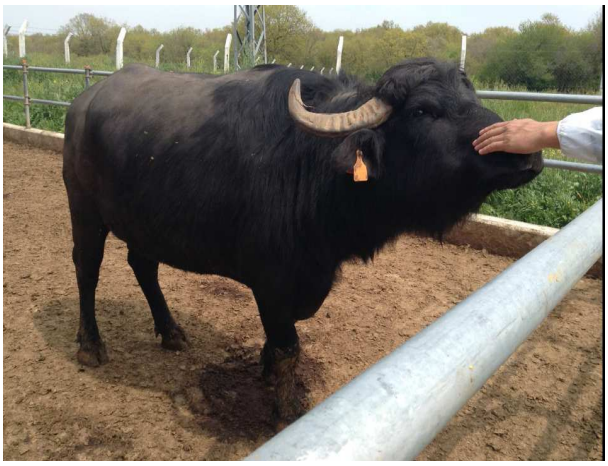
The congress presentations were made under the leadership of Namik Kemal University, Department of Animal Science, Faculty of Agriculture and Istanbul Provincial Stud Buffalo Breeders Associations.

The event was organized in collaboration with the Ministry of Agriculture, Namik Kemal University, Istanbul Metropolitan Municipality , Istanbul Provincial Buffalo Breeders Union, Turkey Buffalo Breeders Center Union, the International Buffalo Federation.

In the evening of April 22rd the welcome reception, in the evening of April 23rdthe gala dinner were held. 26 oral presentations and poster studies on the 1st day, 32 oral presentations and poster studies on the 2nd day, 18 oral presentations and poster studies were presented on the 3rd day.

On the last day of the congress, April 25, Istanbul Provincial Buffalo Union sponsored a farm trip for the guests who came from abroad. Turkey's largest and most modern buffalo facility in Silivri was first visited, afterwards Eris Fodder Factory was toured and finally the opening of Ferdi Özkan's buffalo milking parlour in Örcünlü. Village was performed. The International Buffalo Federation, the Asia Buffalo Association, thanked the Prof. Dr. M. Ihsan SOYSAL. The International Buffalo Federation meeting and the Asian Buffalo Association Annual Board meeting were organized during the Congress. It has been decided that the next Asian Buffalo Congress will be held in Hisar/INDIA and Dr. Inderjeet Singh was elected President of the Asian Buffalo Association.

M. Ihsan Soysal



Figures 1 - 6. Saray Mandire farm, in Silivri district with milking rotary parlour.

Figure 7. Anatolian buffaloes on pasture Nakkas village.

Figure 8. Nakkas village show in typical dresses.

The International Buffalo Federation meeting, Istanbul, April 24, 2015.

The International Buffalo Federation (IBF) meeting was held in Istanbul on April 24, 2014, hosted by the Asian Buffalo Congress.
There were present 20 IBF members, delegates of 11 countries.

The President of the Asian Buffalo Association, Prof. M. Ihsan Soysal, The IBF President, Claudia Roldan and the IBF General Secretary, Prof. Antonio Borghese welcomed the guests.

President Claudia did a small report of the activities of the Committee of the XI World Buffalo Congress, which will be held in Cartagena, Colombia on November 2016, and asked everybody to help and to promote the event.

She asked also to not promote buffalo National events during 2016.

Prof. Borghese presented the activities of the IBF Secretariat, that now is composed by 8 people coming from two Institutes, the Animal Production Research Institute in Monterotondo and the Animal Prophilaxis Research Institute in Roma.

The team is very strong and realized the following activities:

- Production of the Buffalo Newsletter, that is sent to more than 600 people of 32 countries.
- The new IBF website www.internationalbuffalofed.org.

Information and reply to many questions coming from different countries.

Organization of the IBF training course in Latina, Italy, on 16-27 June 2014, where 28 people coming from 11 countries took part. 26 teachers were involved.

Support to many development projects in Bangladesh, Pakistan, Indonesia, China, Thailand, Japan, Brazil. Taking part to all the official buffalo meetings.

According also the Joao Ghaspar de Almeida request, Prof. Borghese proposed some amendments of the Constitution, particularly regarding the system of election of the IBF President: in the past the President was elected by the votes of present IBF Members during the IBF meeting in occasion of the World Buffalo Congress (WBC); during the last WBC in Phuket on 2013, the President was voted by one Official Delegate of each country, according the Constitution by-low.

As it is difficult for the delegations of different countries to elect their representative delegate before the IBF meeting, as many IBF members like to express their vote, as there are some countries with only one IBF member and some countries with many IBF members, who like to express individually, Prof. Borghese proposed to change the vote methodology:
One vote for each IBF Member.

There was a discussion about as some people prefer one vote for each country, some people proposed an intermediate solution, as one vote for 4 members, two votes for 8 and so on.

Any way the General Secretary remembered the IBF Constitution, according what the amendments must be circulated to all members and they are approved if the majority of the members vote in favor of them.

It means that amendments cannot be approved with the vote of the people present in the IBF meeting, as it is a partial representation of total members.

Antonio Borghese

The 5th Scientific Conference For Iraqi Buffalo Development Baghdad, 23rd April, 2015

Talal A. Abdulkareem[1], Sajeda M. Eidan[2], Mohammed G. Abdul-Karim[3] Faris F. Ibrahim[4]

[1] Official Delegate of Iraq in International Buffalo Federation, College of Agriculture, University of Baghdad, Iraq.
[2] Assistant Professor, College of Agriculture, University of Baghdad, Iraq.
[3] Head of Animal Production Department, Directorate of Animal Resource, Ministry of Agriculture, Iraq.
[4] Director of Artificial Insemination Department, Directorate of Animal Resource, Ministry of Agriculture, Iraq.

Under the patronage of the Minister of Agriculture, The 5th Scientific Conference For Iraqi Buffalo Development was held in Baghdad, Iraq on 23rd of April, 2015 under the slogan" The buffalo is a national wealth to build our national economy". The opening of the Conference was done by Representative of the Minister of Agriculture and Technical Deputy of the Ministry Dr. Mahdi T. Al-Kaisy. He praised the great efforts of the establishment of this Conference. He also thanked the Preparatory and Scientific Committees as well as the researchers participated in. He confirmed the highly ministry's efforts to support the buffalo sector in Iraq, by increasing the provision of loans to buffalo owners and the establishment of projects that they develop this sector, such as the buffalo sires, artificial insemination and buffalo karyotyping. Thereafter, Dr. Mussadaq D. Ali, General Director of the Animal Resource and Head of the Conference thanked the participants and attendees and announced the opening of the Conference. Dr. Khalid Al-Fartousi, Delegate of Iraq in IBF presented the Prospect for the Iraq Buffalo Development proposed by IBF and thanked the IBF for its great efforts to develop buffalo sector in Iraq. The participants and attendees were very appreciated for its supportive efforts. Dr. Talal A. Abdulkareem, Official Delegate of Iraq in IBF, was a speaker of the Conference presented " Strategy of the scientific research in developing the Iraqi buffalo". His presentation included the recent technologies applied for Iraqi buffalo in the fields of nutrition, reproductive biotechnologies, diseases control, breading and genetics, management as well as extension. He finally, presented his future prospective for the research strategy to develop the buffalo sector in Iraq.

The Conference involved the following research papers:

1. Effect of whole cottonseed on milk production of Iraqi buffaloes: Extension trial.

Sajeda M. Eidan, Talal A. Abdulkareem, Laith A. Al-Maliki, Faisal K. Al-Saidi, Nadeem K. H. Al-Hassani and Mahdi R. Mahdi

2. Prediction of growth and milk production of Iraqi buffalo (*Bubalus bubalis*) in Babel governorate from hemoglobin type.

Nasr N. Al-Anbari, Hussein A. M. Al-Habobi, Ahmed A. Al-Ani.

3. Classification of Iraqi buffalo according to its karyotype in Al-Furat Al-Awsat region.

Saffa K. Manhood, Mussadq D. Ali, Sallah F. Abbas, Noori F. Nsaif, Shatha A. Al-Jabbar, Nathal H. A. Al-Kader, Salama E. Salman, Jabbar K. Mkasser, Sumaya T. Yuosif, Haidder Mansoor, Saddam Taess and Abed Al -Ameer Essa.

4. Use the random amplified polymorphic DNA to measure the biodiversity in Iraqi buffalo.

Talib A. Jaayid and Falih H. Hamed.

5. Isolation of lysozyme from PMN of buffalo milk and study some of its characterization.

Shaymaa S. Lafta and Anfal S. Lafta.

6. **Effect of total herd size and dairy animal in some production traits and life time period for native buffaloes (*Bubalis bubalis*) in Najaf governorate**.

Baghdasar G. A., Mozan M.S., Al-Anbari N.N., Fayadh A.A., Hadi A.A., Mukheef R.W.

7. **Detection of bovine tuberculosis by comparative cervical tuberculin tests, antigen rapid test and ELISA in a buffalo (*Bubalis bubalis*) herd in Baghdad.**

Waffa A. Ahmed, Ameer H. Abdulameer, Nagham M. Al-Juburi, Elham Buris, Ibrahim K. Salih.

8. **Effect of using natural additives enriched catechins and lycopene on stability of colour fresh buffalo meat during frozen storage (-18°C).**

Ebtesam H.S. Saraj and Hatem H. Salih

9. **Molecular characterization of some productivity traits in riverine buffaloes (*Bubalis bubalis*)**. Daad A. Hussain.

10. **Some factors affected buffalo milk yield and composition in Thi-Qar Governorate.** Maithum A. Azziz and Jameel S. Lazim. The Conference was attended by many researchers, academics as well as buffalo owners. At the end of the Conference, Mr. Qais A. Abdul-Rahman, Director of the Planning and Following up Department, Ministry of Agriculture, read the recommendations of the conference, and the certificates were distributed to the participants as well as to the Preparatory and Scientific Committees. The recommendations were focused on the following points:

1. Establish the conference every three years to give an opportunity for researchers to conduct applied researches focused on obstacles to buffalo production in Iraq.
2. Increasing the loans granted to the buffalo owners to establish the regular projects using recent techniques in the fields of nutrition, reproduction, genetics and management.
3. Encourage the buffalo owners to use the dry breeding system without flooding areas.
4. Conducting field and survey studies to find out the reality of buffalo breeding and faced obstacles in all Iraqi governorate and establish the accurate database to be help for the development in the nearest future.

Dr. Mahdi T. Al-Kaisy, Technical Deputy of the Agriculture Minister

Mr. Qais A. Abdul-Rahman Director of the Planning and Following up Department, Ministry of Agriculture, read the recommendations of the conference**.**

2nd IBF TRAINING COURSE ON BUFFALO MANAGEMENT AND INDUSTRY AND AGREEMENT FOR SUMBAWA BUFFALO DEVELOPMENT

Italy, June 15 - 20, 2015

Organized by: Antonio Borghese, Carlo Boselli, Antonio Fagiolo, Remo Rosati, Vittoria Lucia Barile, Anna Chiacchierini, Leopoldo Iannuzzi, Francesco D'Ausilio, Tiziana Galli, Nello Giorgi, Giorgio Saralli, Giuseppina Maria Terzano, Tiziana Zottola.

For Indonesian Delegation: H. J. Malik (Mayor Sumbawa Government), Prof. Suhubdy (Mataram University), Syafruddin Nur, Iskandar D. Saleh, H. Ismahil, Rini Handayani, M. Lufti, M. Yakub, Sosdialwan (Animal Service Sumbawa Regency), H. I. Mustami, I. Herwansyah (Sumbawa Parliament).

PROGRAM

MONDAY, JUNE 15

9:00 Arrival of Indonesia delegation in the Animal Prophylaxis Research Institute for Lazio and Toscana Regions, Roma, Via Appia Nuova 1411

9.00-13.00 Presentation of the Animal Prophylaxis Research Institute and visit of laboratories. Signature of the agreement with the General Director Dr. Remo Rosati

15.00-17.00 Arrival of Indonesia delegation in the CRA/PCM Animal Production Research Centre in Monterotondo, Via Salaria 31. Presentation of the Animal Production Research Centre and visit of laboratories and of the farm.

17.00-18.00 **Reproduction technologies**

Dr. V.L. Barile

18.00-19.00 M**anagement of buffalo calves and heifers**

Dr. G.M. Terzano

20.00 Hotel Green Palace, Monterotondo

TUESDAY, JUNE 16

8.00 Departure for Napoli

10.30-13.00 Presentation of the Institute for Animal Production Systems in Mediterranean Environment (ISPAAM), National Research Council (CNR) of Italy, Napoli, and visit of laboratories. Signature of the agreement with the Director Dr. Andrea Scaloni

14.00-18.00 Visit of buffalo farms and industries: Fattorie Garofalo

22.00 Hotel Green Palace, Monterotondo

WEDNESDAY, JUNE 17

8.00 Departure for Perugia

10.00-13.00 Presentation of the Bull Centre Chiacchierini in Civitella D'Arna, Perugia, and visit of laboratories. Signature of the agreement with the Director and Owner Dr. Anna Chiacchierini

13.00-15.00 Lunch in a typical restaurant

15.00-19.00 Come back to Latina in Hotel Excelsior, Piazza della Stazione, Latina Scalo

THURSDAY, JUNE 18

8.30 Departure for the Animal Prophylaxis Research Institute in Latina

9.00-10.30 **The buffalo species in the world economy**

Prof. A. Borghese

10.30-12.00 **Health controls: infective pathologies and environmental diseases**

Dr. A. Fagiolo, Dr. G. Saralli

12.00 Departure to Nello Giorgi farm, Campoverde, Aprilia

15.00-16.30 **How a pathology event has to be managed from the farm to the laboratory**

Dr. A. Fagiolo, Dr. G. Saralli

16.30-18.00 **Correct practices of milking and milk production measurements**

Dr. T. Galli, G. Bruni, C. Boselli, A. Borghese

19.00 Dinner in Hotel Excelsior

FRIDAY, JUNE 19

9.00-10.30 **Practical demonstration of milk processing in the Perseo cheese Factory**
Dr. C. Tripaldi, T. Zottola

15.00–17.00 Discussion on Indonesian purposes and problems

Delivery of Diplomas to Indonesian delegates

SATURDAY, JUNE 20

9.30-13.00 Visit of the *Azienda Agricola Casabianca* buffalo farm and cheese factory (Fondi, Latina)
13.00 Farewell lunch and come back to Rome

Agreement signature in the Chiacchierini bull Centre.

Visit in Nello Giorgi farm.

Indonesian and Italian people in Latina Section of Animal Prophylaxis Institute.

Visit in Perseo Cheese Indutry.

Report XI Encontro Brasileiro de Bubalinocultores

Manaus, Brazil 7, 8, 9 October 2015

The meeting took place in Hotel Tropical Manaus Ecoresort, from the 7 to 9 of October 2015, and ended with a buffalo Tour.

An average of 200 participants from Brazil, Argentina, Venezuela, Italy, Colombia, Costa Rica, Bolivia, attended the meeting. The first lecture was held at 14.00 on October 7 by Coronel Mario Coimbra, Brazilian Army, on the use of buffalo as draught animal by the military force in Amazonia. Buffalo is used for transport of material, about 120 kg for each animal, in the forest and trough the swamp areas with Mangrovia and quick sands, until the limit with Colombia to fight the drugs market. Why the buffalo? Because is docile, easy trained, is part of Amazonia culture, while horses do not entry in the forest, do not swim. The buffalo goes also in the night, do not worry for noise as horse.

Cheetah and snakes do not attack buffalo and it can become food for the soldiers. Mediterranean breed is the best for military operations as Murrah for little horns and resistance, Jaffarabady is less adaptable as Swamp breed are typical draft animals but they quite do not exist in Brazil. Actually about 300 buffalo are utilized to draft motors, explosive, combustible, injured soldiers until more than two times their own weight and until 370 kg on the back. The second lecture was held by Dr. Hermes Pessoa, MAPA Veterinary, on Buffalo Livestock in Amazonia. Buffalo species was introduced in Amazonia on 1955 and achieved a great diffusion on the years 1980/90. The livestock limitations are coming by sanitary problems as TBC, brucellosis, by environment problems as flood, erosion and because they are accused for deforestation, meanwhile they feed superficial crops. Therefore buffaloes help the rivers navigability and increase the oxygen in the water, helping the welfare of fishes. Amazonia imports a lot of meat and milk and buffalo could be a solution, introducing refrigerators and meat and milk industry. The third lecture was held by Dr. José Ribamar, EMBRAPA Belem, on the Genetic improvement in Buffalo of Brazil, where the population increasing is 4.3% per year. The lactation length is 270 days with a maximum production of 10 liters per day. Natality is 80%, mortality is 5.3%. Animals for meat achieve weight 450/500 kg live weight at 2 years with 52% of carcass.

Now the new project PROMEBULL is started by EMBRAPA with the purpose of selection and genetic improvement in Brazilian buffaloes. At 19.00 there was the Official Opening of the meeting with the greetings by the Prof. Fabio Jacobs, President of the meeting. Dr. Claudio Varella Bruna, President of the ABCB (Ass. Brasileira Criadores Buffalo) thanked Jakobs and Rodrigo Barauna Pinheiro for the good organization of the meeting. Dr. Jussara Haddad, President of the ACBA (Ass. Criadores Buffalo Amazonia) underlined the advantage of buffalo in comparison with bovine, as buffalo eats more fibrous crops, its milk produces double quantity of cheese, the meat has less cholesterol and the buffalo is more adapted and protects Amazonia environment.

Claudia Roldan, President of the International Buffalo Federation (IBF), invited all the people to take part to the next XI World Buffalo Congress in Colombia, asking the Directors and the researchers of Institutes and Universities to present the results of their projects. Dr. Joao Ghaspar De Almeida introduced the meeting on October 8, presenting the first speaker Alberto de Gusmao Couto, Fazenda Castanha Grande, who spoke about the welfare influence on milk and meat performances. He spoke about the welfare indicators as cortisol and rumen activity, the welfare factors as water and shade availability, vaxinations and worm treatments. He evaluated the welfare with scores from 1 to 3, according the stomach and the skin state. Finally explained the effect of the gentle

treatment and udder cleaning during the milking on the milk production.

The second lecture was held by Dr. Otavio Bernardes, breeder in Sitio Paimeiras da Ingai, who presented the diets for the buffalo in his farm of 91 hectares with temperate climate, obtaining 70% fertility, 20% abortion, 2100 kg milk per lactation.

The third speaker was Angelus Cruz Figueira, breeder, who presented the history of the import of Zebu Nelore from India from 1870 until 2015 and their performances. Actually the breed GIR produces 109 kg of milk in 3 days. The 4th speaker, Mauro Lucio, Projeto Pacuaria Verde, showed his project, introducing animal recording for the genetic development, and underlined as deforestation created pasture but fertility decreased, without land irrigation and fertilization. He said that the small producers have about 500 hectares each, but they are not efficient.

The last speaker was Prof. Antonio Borghese, who presented the strategies for socioeconomic development of buffalo in the Amazonia valley. Prof. Borghese showed the buffalo situation in Brazil, with actual population of 3.5 million head, its history and products. Amazonia was considered by FAO as the Buffalo paradise, for the ideal tropical habitat, where buffaloes can produce meat, milk and work, without causing environmental damage. The Brazilian Amazon region covers 57% of the territorial surface of the country. About 70% of the area (3.37 million km^2) are forest ecosystems, native grassland and savannas of good drained soils and alluvial floodplains. In Amazonia 21 million people (12% of Brazil) are living, of which 4 million working in agriculture (IBGE, 2011). The dry season of low water levels is coming from July to December: during this period the smallholders prepare land and reap the first harvest in October. They plant a second crop when the rains begin in December to harvest in February, before the waters reach the sandbank. When the waters cover the fields in March/April, the buffaloes are removed to high corrals in salt marshes or taken to pastures until the waters begin to recede in July (Vale et al., 2013). During the flood season (December-June) the pastures are flooded and the grazing areas are reduced, but the flood pulse produce soil fertility and high productivity of floodplain ecosystem (Mc Grath et al., 2011), involving different economies: fishing, farming, agriculture, where the buffalo represents one of the most important socioeconomic activity for smallholders and medium farmers. In spite of Amazonia is ideal habitat for buffalo for the hot-humid climate and for the abundance of crops, the buffalo population decreased from 200 thousand head on 2000 to 106,839 on 2013 (ADEPARA, 2013). The decreasing trend is due to low profit of buffalo in traditional farming systems and the farmers prefer perennial pastures without problems of flooding. In addition we have to consider management mistakes, heat stress, infection diseases as brucellosis, foot and mouth disease, tuberculosis for that Neves et al.(2013) found 20.48% of positive animals. Besides *Toxocara vitulorum* causes high mortality in calves (Vale et al., 2013). Furthermore situation of inbreeding provokes various problems of pathological heredity (Vale et al., 2013). Finally the economic stagnation of products, as the buffalo meat is depreciated in the regional market 20% in comparison with bovine one, while in other regions of Brazil buffalo meat has higher prices than in cattle (Vale et al., 2013). At last the farmers, without the ownership of land, cannot be financed by banks and there are some organizations who oppose the presence of buffalo in the floodplains. To avoid the buffalo disappearing in Amazonia, one time the buffalo paradise, it is urgent a project for a new development of buffalo, taking in account the socioeconomic impact for the availability of draught animals, producing high value proteins for children as meat, milk and the effects on local market, where a lot of different products coming by meat and milk processing will be offered. To obtain these goals a new genetic type more productive will be introduced as appropriate technologies in

animal management, reproduction, nutrition, health, pathologies control, quality of products, creating a buffalo pilot Centre as reference point for buffalo improvement. Concerning this situation the Parà State, UFOPA University, Amazonia State, Federal University of Amazonia, FAO, International Buffalo Federation and Italian Institutes are involved to improve genetic capacity for increasing productivity of milk and meat of the Amazonian buffalo by setting out the technical assistance through international cooperation between the Amazonian and the Italian Institutes and FAO.

The first step is the creation of a Buffalo Centre as adequate space protected by flood, with controlled nutrition and reproduction, where the genetic improvement could be effected by artificial insemination using semen with high genetic value. If the systems of semi-intensive herd management will be adopted for regular, no-seasonal production, then modern husbandry techniques should be applied.

Efficient methods of oestrus detection, ovulation inducement for faster postpartum resumption of ovarian activity and the application of artificial insemination could achieve successful results.

An optimum feeding regime, utilizing Amazonian local green fodder will be applied throughout the year, and proper management would also be beneficial. By using these techniques, the rate of conception could be raised to as high as 80 to 85 percent, compared to that achieved using traditional methods, i.e. less than 60 percent. The project will start with the constitution of a Buffalo Pilot Centre in the Amazon valley, in an area where buffalo livestock is an important reality, for example Marajo Island. The UFOPA experts will find the best 200 buffalo cows for production and reproduction efficiency that will be host in the Pilot Centre.

Purpose of the proposed breeding schemes is to produce F1 buffaloes from Mediterranean Italian semen of the best productive level from Chiacchierini bull Centre in Perugia, Italy, on local Amazonian buffaloes, to be used to increase buffalo milk and meat production in Amazonia while maintaining and improving a nucleus of purebred local buffaloes.

The Prof. Borghese proposal provoked a lot of questions and vivacious discussion. The night finished with a beautiful musical performance at the famous old theatre Amazonas of Manaus.

At the following day, October 9, the meeting started with Prof. André Fischer Sbrissia (UDESC), who spoke on the advantages of pasture rotation on feeding efficiency and on milk production.

The second speaker, Prof. Luigi Zicarelli from University of Naples, Italy, spoke about the Buffalo Livestock contribution to production of quality food. He started with the actual problems for that many news are twisted about livestock.

The first one is that the ruminants are accused to provoke CO2 and methane production and planet heating, while really the CO2 and methane production and planet heating are coming from the combustion of coal, oil and gas. Industrial lobbies like this distortion of the true.

The second one is coming from vegetarian people who accuse the meat to be dangerous for the health. On the contrary vitamins of group B as B12 are present only in animal origin food, the CLA produced by rumen is against cancer, the omega 3 omega 6 ratio is more favorable in the animals on pasture.

The third one is that animal production cost a lot of water and energy in comparison with products from agriculture, but the reality is that proteins of high value are produced only by ruminants using crops not utilizable by humans.

Afterwards he showed the economical parameters of mozzarella production in Italy.

The third speaker, Prof. Pietro Baruselli, from Sao Paolo University, presented a lecture on biotechnologies applied in buffalo livestock, showing the benefits of technologies on calving interval and fertility.

He showed also the synchronization protocols as Ovsynch and Sincrogest for fixed times of

artificial insemination with pregnancy rate of 60/64%. After he showed the biotechnologies as MOET, OPU, IVF with limited results for the low efficiency of superovulation and embryo production in buffalo in comparison with cattle: 0.6 embryos/superovulation in buffalo vs.5.1 in Nelore.

The 4th lecture was presented by Prof. William Vale, UFOPA (Parà University) Santarem, who showed a film on a course of artificial insemination at fixed times and different experiences of crossbreeding from China to Philippines to increase milk production. Afterwards he presented the difficulties in Amazonia to develop buffalo livestock and particularly A.I.: pathologies as TBC and brucellosis, inadequacy in management, nutrition, welfare, infrastructures.

Finally Dr. Claudio Varella Bruna, President ABCB, presented the perspectives for buffalo in Brazil, remembering the PROMEBULL project, programs of certification marks on products: mark of milk 100% buffalo, mark COOPERBUFFALO for meat, Baby buffalo for super light meat, marks for cheese, to develop a quality market.

After the lectures, there was a vivacious discussion and the greetings and the meeting was closed.

In the afternoon there was a tour with boats on Rio Negro until the point of meeting of the waters with Rio Solimoes, from which meeting the famous Rio Amazonas is born, even if the waters of Rio Negro and Solimoes remain separate.

The day after Rodrigo Barauna Pinheiro organized a tour in his Carabao farm along Amazonas River, to show the management of buffalo on pasture and the problems linked to dry period, sometimes worse than ones during the flood period.

Antonio Borghese

Carabao farm of Rodrigo B. Pinheiro.

IBF informal meeting in Manaus

VIII Symposium of the Americas and Europe

La Antigua, Guatemala
17, 18, 19 and 20 of November 2015

1. Background and Objectives:

The buffalo association of Guatemala ASOBUFALOS, sponsored the VIII Symposium for buffalo breeders of the Americas and Europe. The symposium brings together professionals from around the world to communicate knowledge in the field of buffalo breeders. Settled as a main objective for this symposium, providing feedback of the buffalo management as a working animal in palm oil plantations and as specific objectives, learn about the current situation of the production systems of the Buffalo in Latin America, the importance and application of the traceability of the buffalo herd in our midst and provide feedback on basis of immunoprophylaxis through application and use of the correct and essential medicines for diseases.

2. Place and date:

The Symposium took place in Hotel Camino Real, La Antigua Guatemala, from the 15 to 20 of November 2015, it started with a Pre event, event and ended with a buffalo Tour. An average of 30 participants from of Argentina, Brazil, Colombia, Costa Rica, Honduras, Mexico and Guatemala attended to the symposium.

3. Symposium activities:

The activities started on Tuesday, November17, 2015, from 07:00 to 18:00 hours, the day Wednesday, Thursday and Friday from 09:30 to 18:00 hours.

4. The VIII Symposium:

4.1 Welcome reception:

The welcome reception took place on Tuesday, November 17 at 09:30. First, the engineer Oscar Molina, on behalf of ASOBUFALOS, welcomed the participants and explained the purpose of the activity was to establish the union of the buffalo guild in the country, likewise, the methodology to be followed.

Then the Presidents of the buffalo associations of Colombia, Argentina, Brazil and Costa Rica, expressed their satisfaction at the realization at this Symposium and advanced new scenarios presented by the buffalo breeders in the world and their modernization processes, in addition, in these processes of association will achieved significant progress in producing Buffalo. They made it clear that is not intended to find solutions for this meeting, but rather, to ensure a mutual understanding of the participants, exchange experiences among them designing a plan to continue this work in the future. Oscar Molina, thanked the participants the effort to carry out this important activity, highlighting the national company Agro Industrias S. A. by sending their representative and invited him to make his presentation on behalf the company which carries out its work of handling and maintenance of Buffalo with triple purpose.

Finally, they started with the presentation of very important topics for the production and management of buffaloes in the region of Guatemala, these topics of much relevance the Enterprise NAISA, which uses to the livestock in work, such as transport activities of Palm oil fruit.

4.2 Highlights:

The symposium was developed in four plenaries of which six topics were of great importance to the management plans and introduction to the company, these were conducted the day 17, 18 and 19 of November

2015. In addition, on November 20, 2015 was a Buffalo Farm Tour: Las Palmas and Rama Blanca. The following topics were in accordance with the system of management in our company.

4.2.1 1st plenary

4.2.1.1 "Current situation of the Buffalo production systems"

It took place on November 17, 2015 at 14:30 hours, the moderator was Cristina Sandoval and as speaker the medical veterinary Mexican Dr. Dora Romero Salas. She explained the introduction and production of the water buffalo to Latin America, mainly in Guatemala and Mexico. The Buffalo, for being a bovine domestic, docile, quiet temperament, sensitive, intelligent, reserved, nocturnal, semi-aquatic, rustic, long-lived and resistant to various diseases. Its rusticity allows this species to adapt more easily to environmental conditions common in our area, even where the cattle do not thrive.

Also by their adaptability has been an increase in our country in tropical and subtropical areas. in 1895 was the first buffalo entry into Latin America, Guatemala entered coming from Trinidad and Tobago during the Government of General Fernando Romeo Lucas García in the years 1978 to 1982. They are currently distributed in the southwest and northeast of Guatemala, the current inventory is unknown, zootechnical management varies according to the production system that takes place on farms.

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4.2.1.2 "Importance of traceability"

It took place on 17 of November 2015 at 16:00 hours, moderated by Cristina Sandoval and as speaker the engineer Ever A. Hernández, Regional Coordinator of traceability in Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama and Dominican Republic.

He explained that traceability is the ability to find and follow the trail, through all stages of production, processing and distribution of an animal intended for the production. Identification and traceability according to the world Organization for Animal Health (OIE) are tools aimed at improving animal health (including zoonoses). Bovine animals, are known for ruminant mammals, classified within the family Bovidae. The regional standard makes reference in this definition to the genera Bos (Taurus and Indicus) and the genus Bubalus (Buffalo).

4.2.1.3 "Feeding Buffalos with tropical grasses"

It took place on November 17, 2015 at 17:00 hours, acted as moderator Cristina Sandoval and as speaker the engineer agronomist Ovidio Perez Beltran representative and distributor for Central America of Marangatu grass seeds. He illustrated on the introduction and establishment of pastures for cattle and buffalo. He explained that the establishment of pastures will depend on many factors among which we can find the original vegetation, the topography of the area, type of declivity, the quality of the land, resource drainage and fertility. This determines the forage species that will be defined, method of preparation and planting, mainly its cost/benefit ratio.

4.2.2 2nd plenary

4.2.2.1 "Entrepreneurship and sustainability of a buffalo herd"

This plenary was on November 18, 2015 at 13:30 hours, moderated by Cristina Sandoval and as speaker the medical veterinarian Brasileiro Doctor Claudio Bruna, President of

the Association of Brazil. He explained that it seeks to stimulate reflection on innovative conceptual frameworks. However, the livestock is one of the main agricultural products in many Central American countries, but which have been eroded as a model of productive development. In addition, the analysis of sustainability will be covered the multiple variables that affect livestock and their consequences and environmental impact.

4.2.2.2 "The Buffalo as a working Animal in the African Palm plantations, rubber and coffee"

This plenary was on November 18, 2015 at 18:00 hours, moderated by Cristina Sandoval and as speaker the engineer Hugo Vélez. Where he showed the importance of the introduction of the domesticated Buffalo to different areas and activities of labour, transport and loading. He emphasized in the process that takes from weaning until the introduction as a working animal, the nutritional, health and maintenance are the main elements of management that should never miss in the production of a livestock herd, this case with the buffaloes.

4.2.3. 3rd plenary

4.2.3.1 "Foundations of immunoprophylaxis for buffalo herds"

This plenary was on November 19, 2015 at 11:00, moderated by Cristina Sandoval and as speaker doctor veterinarian Adolfo Kopp. Speaking of the importance of sanitary controls in cattle herds in the area, essentially pointing:

Peten has become a very important livestock area for the country, since it focused a significant amount of the national cattle herd, especially for farmers in the area, who for reasons of border with two countries (Belize and Mexico), are affected by the import of cattle without the respective sanitary controls.

Our country has been characterized for the non effective epidemiological and quarantine disease measures, for this reason many diseases have entered and spread without taking the appropriate measures for the control and eradication.

4.3 Closing plenary

4.3.1 "Visit to Finca Las Palmas"

It took place on November 20, 2015 to 07:00 hours, directed by the engineer Oscar Molina and the degree in animal husbandry Sucel Molina. The visit consisted in a verbal illustration of the company Las Palmas process plant, then a tour of the facilities. Also, a visit to the soap factory, to observe the production and packaging process of soap. In addition, a visit to the palm oil plantations to observe the handling that occurs in fruit-picking and maintenance of the herd of buffaloes, in this area was a demonstration of the process and importance that wastes from fertilizers, chemicals and others do.

4.3.2. "Visit to Finca Rama Blanca"

Transfer was made on November 20, 2015 at 13:30 hours towards Finca Rama Blanca, visit directed by the engineer Oscar Molina and Sucel Molina. After enjoying a delicious lunch with Buffalo meat, we visit the area where buffalo had the application of ear rings and chip suggested by the bovine traceability program.

Then, was the area of processing of dairy, where the buffalo milk is processed with high standards of safety into dairy and its derivatives.

Conclusions:

The Association of Buffalo breeders of Guatemala ASOBUFALOS, through its speakers reiterated on the bibliographic review of buffalos, since its origin, distribution,

Zoological classification, types, breeds with their characteristics, systems exploitation, management, power, digestive system, reproduction efficiency, anatomical differences, production of milk, meat, work and general aspects. The Association of Buffalo breeders of Guatemala ASOBUFALOS promoted the Symposium in order to meet with together and associate producers and breeders of Buffalo in Guatemala. The association and information to the staff, about new technologies are part of the tools that are necessary to use in agricultural operations and livestock, in order to maintain a level of efficient and competitive production. Formation and training programs, are essential to generate an awareness of mutual understanding, cooperation and assistance between sectors. However, training activities have been limited. Recommendations:

The company incorporates as an active member to the Association of buffalo breeders of Guatemala ASOBUFALOS, this will bring important benefits in the achievements of animal production. Proceed with the bovine traceability program, to have a better control of the incidences of disease area and provenance of the animals purchased for its integration into the harvest area. The association promotes the reproductive and productive management of buffalos heard, from it depend the production of dairy products (milk, cream and cheese to the internal dining rooms), breeding stock (replacements for the herd and sale of buffalos to other holdings).

Lic. Zoot. Jorge Fabio García Molina
Colegiado No. 1,172
Transporte y Semovientes
Nacional Agro Industrial S. A.

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Figures 1 – 3. Symposium pictures

Figure 4. Picture of the visits.

Short presentation of the national project in Romania

"RESEARCH ON CONVERSION POTENTIAL OF CONVENTIONAL BUFFALO DAIRY FARMS INTO BIO-MILK FARMS, BY ESTABLISHING A MODEL AND A CODE OF GOOD PRACTICE"

(ACRONYM - BIOBUFFALO), 169/2014, www.goodlact.ro

Prof. Dr. Livia Vidu,
vidulivia2014@yahoo.com
University of Agronomic Sciences and Veterinary Medicine Bucharest

On the background of the decreasing buffalo population in Romania, stopping this process greatly depends on the success of obtaining specific organic dairy products to ensure farm efficiency. In most of the cases, buffalo milk is collected together with cow milk, at the same low price (approx. 0.45 EUR/litre), reducing the interest of farmers for buffalo breeding.
The overall objective of the project is to establish a model of organic buffalo milk farm and a code of best practice for converting conventional farms to organic farms.
Specific objectives of the project are:

- Implementing modern technologies for buffalo breeding in Romania,
- Analysis of land conversion potential for organic farms fodder,
- Comparative financial analysis between conventional and organic farms.

Derived objectives are:
- Establishing a partnership between research and development organizations (USAMV Bucureşti, SCDCB Şercaia) and a food industry company, in order to reach a functional model, that can be transferred and replicated at national level;
- Promoting buffalo milk products;
- Improving the quality of life in local communities.

The project's results will be applicative and replicable by upgrading a buffalo farm and developing a code of good practice.
The project is economically justified by the fact that now, on both domestic and external markets (Europe and America), the demand for buffalo dairy products is only covered up to 15%.
It is necessary to say, the prices for such products are quite high.
Considering the traditional buffalo breeding areas, centre and northwest Romania, obviously working as an ecosystem, we believe that the promotion of sustainable organic farms and biodiversity conservation must be national priorities.
Romanian buffalo is well adapted to local climate conditions, its breeding has low costs and represents a valuable genetic material at both national and EU level.
It is also an opportunity to produce milk for both fresh consumption and especially for traditional cheese.
It may also represent an important source of income for local farmers and an alternative to revive ecological animal breeding.
BIOBUFFALO project is structured in four scientific work packages (Figure 1) that realize the research, implementation and achieving project results.
The work packages are coordinated by a consortium partner and in their work is the responsibility of each partner.
Work Packages have market potential results that will be used in organic farming in Romania and internationally.

The first work package covers “Scientific study on buffalo milk production and dairy processing” and was done in 2014.

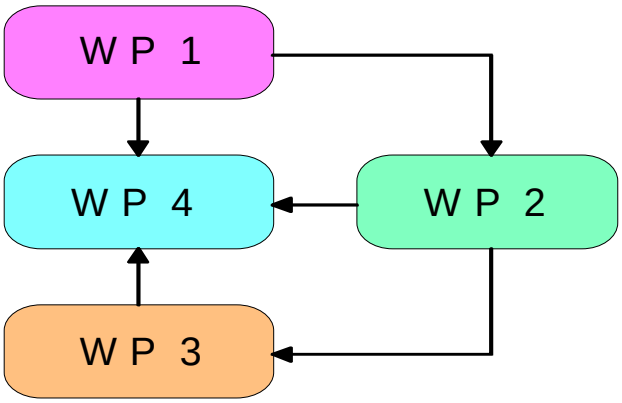

Figure 1 - interdependence work packages

The activities in this work package were: identification of Fagaras buffalo farms and start an agreement of cooperation, -analysis of material and technical base of Fagaras farms, -study of the buffalo milk products market.

In 2015 we conducted work package 2 - Land conversion potential of organic farming fodder, with the activities: analyze of soil’s profile and physical-chemical and microbiological composition, analysis of physical-chemical and microbiological buffalo milk composition, comparative financial analysis of different types of buffalo milk farms. In 2016 we have to realize these objectives: implementation of modern technologies of buffalos housing through modernization of two shelters.

System of two old shelters with linked exploitation of buffaloes, transformed and modernized in two shelters for 137 buffalos for milk, and 168 youth.

Upgraded sheds should include: the exploitation in individual couches to rest; concrete floors littered with paths of movement; couches with bedding or carpet of rubber; feeding system, exterior, located between shelters; watering system; natural ventilation system.

This activity will be carried out at the Institute of Research and Development for Buffalo – Sercaia.

The last objective of the project is to develop the good practice code for milk buffalo in bio farm.

The good practice code is a set of scientific and technical knowledge that are made available for the dairy buffalo breeders so that they can be implemented by each farmer in order to achieve higher quantitative and qualitative productions and limiting the adverse environmental consequences at local, regional or national area for short term or long term.

The good practice code is also a guide for exploitation of the dairy buffalo stating the followed standard procedures and the restrictions for housing, feeding, milking, ensuring the biological material and the production capitalization.

Buffalo development in the Bangladesh Buffalo Centre

Quazi M. Emdadul Huque and Asma Khatun

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Genetic Resources of Buffalo at "Bangladesh Buffalo Centre" under Lal Teer Livestock Limited belongs to the Asian Buffalo of the species *Bubalus bubalis*, subspecies River. The River buffalo of the Indian sub-continent, Egypt and Mediterranean basin of Europe and Asia is maintained mostly for milk production (Cockrill, 1982) and is also used for dual purposes, exhibiting good meat characteristics, though their potential for meat still remains less unexplored and unexploited. These animals require a relatively low level of inputs in the predominantly mixed farming systems and are well known for their ability to thrive on low-quality crop residues and green forage (Resali, 2000) under harsh climatic conditions.

In Bangladesh, buffaloes play important role in providing milk, meat and draught power. The total buffalo population is about 1.46 million (DLS, 2015) in Bangladesh of which coastal regions possess about 40% (Faruque et al., 1990). Buffalo is considered to be a multipurpose animal and is extensively used for agricultural production (ploughing, laddering, transportation of goods, threshing and crushing etc.). In Bangladesh, buffaloes are reared by many races under diverse agro-climatic conditions of with some differences in its management practices particularly with regard to their major function in local agriculture. Buffaloes contribute about 3-4 % and 5-6 % of the total milk and meat produced respectively, in the country (BBS, 1991). The contribution of buffaloes to the total output is not static, rather varies depending upon population size and localities.

The buffaloes of Bangladesh are mainly indigenous in origin and their productivity is very low and their genotypes must be improved through appropriate breeding program to meet the future demand of the country. In view of the above situation, Bangladesh Buffalo Centre, as the first private sector organization in Bangladesh belonging to the Lal Teer Livestock Limited, Multimode Group of companies, which started functioning from the end of 2010, undertook breed improvement programs for maximum productivity through research & development (R & D) and extension for buffalo, initially with technical collaboration of Dr. Antonio Borghese of the International Buffalo Federation, the Bangladesh Agricultural University and the Animal Production Research Institute, Italy. It introduced famous breed Mediterranean semen from Italy and used in indigenous buffalo in own buffalo centre as well as contract growing household farm to improve productivity from existing buffalo.

Buffalo Germplasm in Bangladesh

Bangladesh buffaloes belong to the *Bubalus bubalis* with most of the population are river type with exception of some swamp type found in eastern part of Bangladesh. The undefined crosses population (Faruque et. al,1990) with Murrah, Nili-Ravi, Surti and Jaffarabadi blood level are scantly available surrounding Indian border of Bangladesh due to border migration from India (Huque and Borghese,

2012). Bangladesh imported a small number of Nili-Ravi from Pakistan during 1960 without any scientific improvement program. Department of Livestock Service (DLS) again imported 100 live Nili-Ravi pregnant heifer and 1st lactating cows from Pakistan during 1990 that were reared in newly established Buffalo farm at Bagherhat district, in south-west part of Bangladesh. Most of the buffaloes are non-descriptive in type for the variable composition of crosses among various breeds and cannot be categorized in any well-established breed. They are concentrated particularly in agro-ecological zones viz. sugar-cane belt, hilly region, coastal area and marshy land. In Brahmaputra-Jamuna flood plain area, dairy buffaloes are observed along the riverside village of Rangpur, Bogra, Jamalpur and Mymensingh district. They are also distributed along the coastal areas of Noakhali, Feni, Laxmipur, Bhola, Patuakhali and Borguna district. Draught buffaloes are found in sugar-cane belt and forest areas-like Jamalpur and Modhupur (Faruque, 2001). No clear information is yet available about the origin of the water buffalo available in the country.
The buffaloes of the country may be put into following five distinct groups on the basis of their history of domestication, distribution and morphology.

Group	Types
Western part	Indigenous Murrah type
Eastern part	Swamp type
Southern part (coastal areas)	Wild type Arni/Crossbreed type
Central part (Brahmaputra-Jamuna belt)	IndigenousRiverine type
Exotic breed crosses	Mediterranean, Murrah, Nili-Ravi, Surti, Jaffrabadi

Buffalo Genetic Resources at Bangladesh Buffalo Centre

Buffalo in Bangladesh did not get any attention from the policy maker and professional in the past time. There was no specific breeding policy for buffalo improvement in Bangladesh that's why buffalo cannot contribute its own potentiality. All buffaloes are local varieties and there is no systematic mating plan or breeding policy. The milk production is about 2 to 3 litres per buffalo cow with seasonal variations. The centre undertook to characterization of indigenous buffalo and started its improvement program through Mediterranean buffalo semen. Recently the Government of Bangladesh also took insemination program for indigenous buffaloes. Phenotypically the buffalo's type is:

1). Indigenous Murrah type:
The Buffaloes of this group is different from other breeds. Their coat colour is usually black and some animals have brown coat colour with sport in the tail switch. White stockings are also observed in some animals that have brown coat colour. The horns are short, tight, turning backward and upward and finally spirally curving inward. The horns should be somewhat flattened. As the age advances the horns get loosened slightly but spiral curves increases. Body sound built, heavy and wedge shaped. Head comparatively small, face and neck comparatively long .Skin is soft, smooth with scanty hairs as compared to other buffaloes. Udder fully developed and drooping. Teats equally distributed over the udder but hind teats are longer than fore teats. Purpose of breed: Dual type; males are used for meat purpose and females for dairy.

Fig.1 .Indigenous Murrah type bull in Lal Teer R & D centreFig.2.Indigenous Murrah type cow in Lal Teer R & D centre

Morphological characteristics: Cows are good sized and possess better milking ability. Males are bigger in size than female. The morphometric characters of Indigenous Murrah buffalo are as follows-

Sl. No.	Characters	Measurement (cm)
1	Body Length	145
	Height	134
	Heart girth	188
2	Horn Length	37
3	Ear Length	23
	Width	16
4	Tail Length without switch	94
5	Teat Length	6
	Diameter	7.64

Reproduction characteristics:

Average reproductive performance of Indigenous Murrah heifers and cows are presented as follows-

Sl. No.	Traits	Value
1	Age at puberty (days)	1080
2	Age at first calving (days)	1440
3	Calving interval (days)	559
4	Services per conception	1.7
5	Gestation length (days)	304
6	Dry period (days)	234

N.B: Reproductive traits vary due to maternal and environmental factors like feeding, management etc.

Production characteristics:

The productive performance of Indigenous Murrah heifers and cows are presented as follows-

Sl. No.	Characters	Value
1	Birth weight (Kg) Male Female	30 27
2	Adult weight (Kg) Male Female	550 450
3	Milk yield per day (litres)	2.27
4	Lactation length (days)	387
5	Lactation yield (litres)	878
6	Fat content of milk(%)	7.2
7	Protein content of milk (%)	3.9
8	Calf mortality (%)	3.5

N.B: Productive traits vary due to the difference in management and feeding system, environmental change or genetic variation.

2). Indigenous plain land riverine type:

These types of buffaloes are found in river basin areas of the river Brahmaputra and Jamuna of the central part of the country. Their morphological characteristics are almost similar to those of the western part. Their coat colour is usually black. The utility and management practices are the main differences between these buffaloes with those of the western part of the country. They are kept absolutely for dairy and meat purposes. The horns are medium in size and curving inward. Body sound build, medium and wedge shaped. Head are medium in size, face and neck comparatively long. Skin is slight course with long hairs as compared to other buffaloes. Udder fully developed and drooping. Teats equally distributed over the udder but hind teats are longer than fore teats.

Purpose of breed: Dual type; males are used for meat purpose and females for dairy.

Fig.3.Indigenous plain land riverine type buffalo in Lal Teer R & D centre

Morphological characteristics: The morphometric characters of Plain land riverine type buffalo are as follows-

Sl. No.	Characters	Measurement (cm)
1	Body Length	131
	Height	130
	Heart girth	174
2	Horn Length	31
3	Ear Length	28
	Width	20
4	Tail Length without switch	82
5	Teat Length	3.66
	Diameter	6.33

Reproduction characteristics: Reproductive performance of Plain land riverine type buffalo is presented as follows-

Sl. No.	Traits	Value
1	Age at maturity (months)	48*
2	Age at first calving (months)	59 *
3	Calving interval (days)	573
4	Services per conception	1.25
5	Gestation length (days)	306
6	Dry period (days)	216

** Faruque 1991*

N.B: Reproductive traits vary due to maternal and environmental factors like feeding, management etc.

Production characteristics: The productive performance of plain land riverine type buffalo is presented as follows-

Sl. No.	Characters	Value
1	Birth weight (Kg) Male	31.33
	Female	26
2	Adult weight (Kg) Male	490
	Female	400
3	Milk yield per day (litres)	1.93
4	Lactation length (days)	289
5	Lactation yield (litres)	558
6	Fat content of milk(%)	9.1
7	Protein content of milk (%)	3.6
8	Calf mortality (%)	3.8

N.B: Productive traits vary due to the difference in management and feeding system, environmental change or genetic variation.

3). Wild Type Arni/crosses:

The wild/crosses type buffalo is referred to a different species (*Bubalus arnee)* which is not *characterized at all.* They are grey to black in colour with off-white "socks" and one or two white chevrons on the neck. Horns in both sexes curve backward in a crescent. The record horn length is just less than 2 metres (6.6 feet)—the longest among cattle or any other bovid. The hooves are large and splayed, and two flexible joints (fetlock and pastern) near the hooves allow for easier walking through deep mud. Longevity of the domesticated water buffalo can be 40 years, but the wild form is not as long-lived, even in captivity. This wild form is a huge animal, nearly 3 metres (10 feet) long and 2 metres tall and weighing up to 1,200 kg (2,600 pounds); females are about two-thirds this size. It can interbreed with domestic water buffalo. Wild type buffalo live in Southeast Asian swamps and forests, where they feed on grass and sedges, mostly at night. By day they rest in water up to their nostrils, or they wallow and "shovel" mud on themselves with their horns to keep cool and escape biting insects. In Bangladesh, this types of buffalo is also found in the coastal area of the southern part. They are larger in size than the other indigenous buffaloes of that area.

Purpose of breed: Mostly meat and partially harvest milk.

Fig.4. Wild type arni in Lal Teer R & D center

Morphological characteristics: They are of various sized animals possessing high level of phenotypic variations for most of the economic traits. The morphometric characters of wild type arni buffalo are as follows-

Sl. No.	Characters	Measurement (cm)
1	Body Length	139
	Height	132
	Heart girth	182.57
2	Horn Length	51.69
3	Ear Length	25.58
	Width	14
4	Tail Length without switch	79

5	Teat Length Diameter	4.46 6.9

Reproduction characteristics:

Reproductive performance of wild type arni buffalo is presented as follows-

Sl. No.	Traits	Cows
1	Age at Puberty (days)	1050
2	Age at first calving (days)	1410
3	Calving interval (days)	582
4	Services per conception	2.5
5	Gestation length (days)	304
6	Dry period (days)	218

N.B: Reproductive traits vary due to maternal and environmental factors like feeding, management etc.

Production characteristics:

The productive performance of Wild type arni buffalo is presented as follows-

Sl. No.	Characters	Value
1	Birth weight (Kg) Male Female	29 27
2	Adult weight (Kg) Male Female	512 433
3	Milk yield per day (litres)	1.65
4	Lactation length (days)	306
5	Lactation yield (litres)	504
6	Fat content of milk(%)	8.6
7	Protein content of milk (%)	3.9
8	Calf mortality (%)	3.0

N.B: Productive traits vary due to the difference in management and feeding system, environmental change or genetic variation.

4). Exotic Cross (Mediterranean Italian x Local F1):

The non-descriptive crosses are found in different parts of the country. However, there are no clear authentic records on this. The Lal Teer Livestock is the only private organization in Bangladesh which started buffalo improvement program using the tools of artificial insemination as a crossbreeding program of **Mediterranean Italian** semen from Italy on local buffalo in its R & D Farm. The centre started AI program from 2011 and also synchronization program at their R & D centre. At present the centre has 56 F_1 buffalo with 27 males and 29 females with maximum age of 35 months.


Fig.5. F1 Bull in Lal Teer R & D centreFig.6. F1 Female calf in Lal Teer R & D centre


Fig. 7. Prof. Borghese visit at Lal Teer R & D centre

Fig.8. Calves group in Lal Teer R & D centre

Sl. No.	Traits	Male	Female
1	Ave. Birth wt. (kg)	40.5	37.25
2	Ave. growth rate g/day (1-9 months)	736	691
3	Ave. body wt. (kg at 9 months age)	239	224

5). Local calves:

The centre has indigenous buffalo replacement program with local elite male. With this program, at present, the centre has **23** calves in its R & D centre.

Fig.9.Local Male in Lal Teer R & D centreFig.10. Local Female in Lal Teer R & D centre

. No.	Traits	Male	Female
1	Ave. Birth wt. (kg)	29.06	27.76
2	Ave. growth rate g/day (1-9 months)	503.23	463.85
3	Ave. body wt. (kg at 9 months age)	165	153

Activities of the Centre

The Bangladesh Buffalo Centre of Lal Teer Livestock Limited have nucleus breeding farms and breeding bull stations of buffalo for semen production and community based contract growing farms for quality bull selection support program. It produces semen from locally supported bulls, crossed with the imported frozen semen of Mediterranean Italian, creating a distribution/marketing activity through artificial insemination for increasing milk and meat production throughout the country. The centre have buffalo improvement program at household farming, semi-intensive and extensive farming systems in selected regions of the country. Late puberty, silent heat, long calving interval and seasonal breeding are characteristics those hamper the reproductive performance of the water buffalo. Several techniques have been used to improve their reproductive efficiency. Ovulation program - fixed time artificial insemination (Ovsynch-TAI) has been applied as the most popular solution with prospective results. The centre continuously conducted synchronization program in its R & D Centre. The results of synchronization program which conducted at different times are given below-

Phase of synchronization	Month of synchronization	No. of synchronized animal	No. of conceived animal	Conception rate (%)
1st synchronization	October/2011	35	20	57.14
2nd synchronization	August/2012	37	24	64.86
3rd synchronization	February /2013	25	07	28
4th synchronization	Oct-November/2014	30	16	53.33

The centre is producing buffalo frozen semen from cross bred buffalo bull (F1) and is going to use in R & D farm, founding a conception rate of 70%, as the average birth weight of its calves is 40 kg(male calf) and 34kg (female calf).

Performances of F1 cross (Mediterranean X Indigenous).

The centre imported Mediterranean buffalo frozen semen from Italy and crossed with indigenous buffaloes and produced 56 F1 buffalo (29Male and 27 female). Production and reproduction performance of F1 (cross bred) are given below:

Average reproduction and production status of our F1 cross buffalo at the Centre

Production status					Reproduction status			
Birth wt(kg)	Wt at 12M(kg)	Growth rate at 12M(g/d)	Lactation period(d)	Lactation yield(L)	Age of 1st calving for heifer (M)	Gestation period(d)	Calving interval(d)	Service per conception
40.5 (n=29)	276 (n=29)	645.20 (n=29)	-	-	41.3 (n=7)	308.9 (n=7)	-	1.6

The production and reproduction status of indigenous buffalo at the centre are furnished below.

Average reproduction and production status of indigenous buffalo at centre

Production status					Reproduction status			
Birth wt(kg)	Wt at 12M(kg)	Growth rate at 12M(g/d)	Lactation period(d)	Lactation yield(L)	Age of 1st calving for heifer (M)	Gestation period(d)	Calving interval(d)	Service per conception
28.41 (n=23)	190.7 (n=23)	442.76 (n=23)	311.20 (n=55)	598.06 (n=55)	42.23 (n=8)	309.63 (n=55)	482.66 (n=35)	2 (n=55)

In comparative performances, it was found that the F1 crosses show higher performances at our centre. The crossing program has been undertaken to on-farm at farmers' level. It needs more time o get the results at farmers household.

Buffalo Genome Decoded by Lal Teer Livestock

Lal Teer Livestock Limited (LTL) and Beijing Genomics Institute (BGI) jointly sequenced buffalo genome under a three-year project based on Bangladeshi indigenous buffalo stock. It was announced at a press briefing on January 24, 2014 by the Beijing Genomics Institute and Lal Teer Livestock Limited. The activities are continuing and it will contribute to the country's milk and meat production using the genetic information of local buffalo.

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REMEMBRANCE

In memory of professor Pablo Moser

PETER E. PIÑATE B.

On what did the successful entrepreneur Pablo Moser Guerra leave the city and go with his family to tame the plain, his fearlessness certainly had to do.

"The plain called him" to acquire and bring to initially produce with his brother Leon, the old herd The Guanota in Apure. Without much experience in herds, the task was epic.

Herd located between the old and new river bed of the Apure, shortly after the mouth of the Portuguese, it was mostly a mirror of water in winter. Raising or planting was most difficult because the flooded savanna offered the greatest challenge. Unknowingly, Moser became a tamer plain. With the help of his other brother Ramon, earthmoving entrepreneur and his "big machine" giant custom-built excavator for sanitation floodplain, they rushed modulating Guanota with the same technique of the Dutch polders millennia.

The modulated herd was protected by kilometers of flood dykes, willing to retain excess water to irrigate winter in summer. Given the heavy rains the water inside the module must be drained for the winter what is done with large pumps, similar to those used in the construction of the Guri Dam.

As taming the flood plain would require making sustainable animal production, the alternative was and is raising dairy buffaloes.

A passionate expert joined the task: Dr. Abelardo Ferrer, a distinguished veterinarian and agronomist.

With it, Pablo Moser Guerra first imported dairy buffaloes from Italy and Bulgaria.

The Guanota soon became school "Búfaleros" and thanks to the extraordinary play and good breeding, since hundreds of small producers have benefited Búfaleros.

Moser industrialized simultaneously producing authentic buffalo mozzarella cheese, and "Bufito" fresh buffalo milk, never before produced in the country.

Outstanding as a breeder of dairy buffaloes, The International Buffalo Federation elected him President in 1998 and he organized the World Buffalo Congress in Maracaibo, Venezuela on 2001.

Giving the example to follow, he worked tirelessly until the last day of its 90 years. So Pablo Moser Guerra achieved the dressage of the plain of his country, Venezuela.

11th World Buffalo Congress

PROGRAM

Cartagena de Indias, Colombia, South America.

PLACE: Convention Center Hotel Americas.

PRE-CONGRESS COURSE: Monday 21 and Tuesday 22 November 2016

CONGRESS: Wednesday 23, Thursday 24 and Friday 25 November 2016

BUFFALO LOCAL TOUR: Saturday November 26, 2016

TOUR BUFFALO other regions: Sunday 27, Monday 28 and Tuesday 29 November 2016

http://www.wbc2016.net/site/index.php

THIRD IBF TRAINING COURSE ON BUFFALO MANAGEMENT AND INDUSTRY Colombia, November 15-22, 2016

PROVISIONAL PROGRAM

TUESDAY, NOVEMBER 15	
9.00-13.00	Arrival of participants, check-in to accommodation and registration
15.00-19.00	Visit of the Animal Research Institute or buffalo farm

WEDNESDAY, NOVEMBER 16	
9.00-11.00	**Welcome and Course presentation** Dr. Claudia Roldan, IBF President
11.00-13.00	**Buffalo Livestock and Products** Prof. Antonio Borghese
13.00-15.00	**Lunch**
15.00-17.00	**Modern technologies in buffalo farming** Prof. Luigi Zicarelli
17.00-19.00	**Nutrition and Feeding in buffalo species** Prof. Federico Infascelli

THURSDAY, NOVEMBER 17	
9.00-11.00	**Infective and environmental diseases** Dr. Antonio Fagiolo, Dr. Giorgio Saralli
11.00-12.00	**Reproduction pathologies in male and female buffaloes** Prof. William Vale
12.00-13.00	**Estrous control and Artificial Insemination** Dr. Vittoria Lucia Barile
13.00-15-00	Lunch

15.00-17.00	**Reproduction Bio-technologies** Prof. Pietro Baruselli
17.00-18.00	**Ultrasonography for evaluation and improvement of**

	reproductive efficiency Dr. G. Maria Terzano
18.00-19.00	**Semen production in a Buffalo Bull Centre** Dr. Anna Chiacchierini
	FRIDAY, NOVEMBER 18
	PRODUCTS AND QUALITY SESSION
9.00-11.00	**Milk production, quality and processing** Dr. Carmela Tripaldi
11.00-12.00	**Mozzarella cheese and Ricotta in Italian Industry** Dr. Tiziana Zottola
12.00-13.00	**Meat production and quality**
13.00-15.00	**Lunch**
15.00-16.00	**Carcass conformation, fatness and dissection**
16.00-18.00	**Meat processing techniques**
	SATURDAY, NOVEMBER 19
9.00-18.00	Tour in buffalo farms with practical experiences on milking and on milk production measurements. Practical demonstrations on reproductive controls. C. Roldan, A. Borghese, C. Boselli, P.Baruselli, W. Vale, G.M. Terzano, V.L. Barile
	SUNDAY, NOVEMBER 20
	MONDAY, NOVEMBER 21
9.00-13.00	**Practical demonstration of meat processing in the Industry**

TUESDAY, NOVEMBER 22

9.00-18.00	**SESSION ON FUTURE STRATEGIES IN DIFFERENT COUNTRIES** **Guidelines for sustainability** **Critical points for sanitary aspects** **Milk for direct consume in world economy** **Meat market strategies** **Critical points in industry processing** A. Borghese, A. Fagiolo, R.K. Sethi, Suhubdy, Talat N. Pasha, J. Ghaspar de Almeida, R. Garofalo, Y. Bingzhuang.

Diploma delivery to the participants

TOTAL COST INCLUDING MEALS AND HOSPITALITY: 800 US DOLLARS

Inscriptions and information request can be sent to Prof. Antonio Borghese - antonio.borghese@email.it; antonioborghese@live.it