

Buffal Newsletter



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BULLETIN OF THE FAO-SCORENA 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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The Editorial board is happy to present the 35th number where a broad space is dedicated to **reports** from Bolivia, Egypt, Pakistan, Venezuela. The section gives also an overview of the 12th world Buffalo Congress held in Istanbul (Turkey) on September 18-20 2019.

In the section **worldwide buffalo activity** is presented the next 13th World Buffalo Congress, to be held in China, 10-13 October 2020.

This newsletter ends as usual with the updated list of IBF members.

Wishing you a good time reading, we would like to thank all the people who have helped in the editing of this publication and remind you all, that your contribution (scientific reports and/or events) will be greatly welcome.

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REPORTS

12th WORLD BUFFALO CONGRESS REPORT – Istanbul TURKEY



The 12th World Buffalo Congress was held in the Harbiye Military Museum and Cultural Center in Istanbul, Turkey, on 18-20 September 2019, with the title: Efficient Production for the World.

It was organized by the President of the International Buffalo Federation (IBF) Prof. M. Ihsan Soysal.



PROF SOYSAL AT OPENING CEREMONY

After the Opening Ceremony on September 18, 2019, where Prof. Soysal and different Authorities from Ministries, Universities and Farmers Associations declared their purposes in buffalo field, different invited speakers presented their lectures in plenary session.

Prof. Antonio Borghese, Italy, spoke about Sustainable models based on energy produced by animal draft, underlining the drama of climatic change and as the buffalo



OPENING CEREMONY

livestock could be directed to more sustainable models, producing less emission of CO₂ and Methane and less pollution, particularly improving animal draft.

Dr. John Williams, Australia, presented a lecture on the buffalo genome and the application of genomics to buffalo breeding.

Dr. Inderjeet Singh, India, showed the Recent breakthrough in modern buffalo production systems in India.

The day ended with the welcome cocktail.

The day after, September 19 was opened with an invited speaker in plenary session, Prof. Stefano Biffani, Italy, who showed the new selection index for the Italian Mediterranean buffalo, adopted by ANASB, the Buffalo Breeders Association of Italy.

After that, the lectures were presented in 3 different sessions: milk and milk products, genetics, health.

After lunch there were two invited speakers in plenary session: Prof. Talat Pasha on Modern processing techniques for improving buffalo meat sector of Pakistan, and Prof. Giuseppe Campanile on Embryonic and fetal mortality in River Buffalo. After them 3 different sessions were opened, including also reproduction, management, nutrition, and finally the poster session.

At 6 p.m. the General Assembly of the International Buffalo Federation was held. The IBF President, Prof. Soysal welcomed and thanked the 50 IBF members present at the assembly. Prof. A. Borghese, the IBF General Secretary, showed the IBF activity in the last 3 years, organizing every year a Congress, the American and European Symposium in Campeche, Mexico on 2017, the Asian Buffalo Congress in Hisar, India on 2018, the World Buffalo Congress in Istanbul, Turkey on 2019. The Secretariat, with the cooperation of Dr. Vittoria L.



PROF SOYSAL AND IBF SECRETARIAT

Barile and Antonella Chiariotti, published every year one or two numbers of the Buffalo Newsletter, maintained information by email, Facebook, WhatsApp, Twitter, organized two training courses on Buffalo Management and Industry, the 3rd on May 2017, the 4th on May 2019. Finally, the IBF, with 117 members, representing 39 countries, is opening local offices, the first was opened in Thi-Qar, Iraq, directed by Prof Khalid Al Fartosi, as focal point for the new project to develop Mesopotamian buffalo in the Marshlands.

After that the countries who presented their candidatures for the next Presidency and for the next World Buffalo Congress were invited to speak. The first were the representatives of Venezuela, Nicola Fabbozzo and Jairo Fernandez, who retired their candidature, for the unstable condition of the country, hoping in the future. Also Dr. Inderjeet Singh from India, retired his candidature, because it was presented the day before the Congress, while it must be presented 6 months before, according IBF Constitution and by-law.



IBF ASSEMBLY

China delegation, presenting Prof. Yang Ligu as candidate for IBF President, showed his program for the World Buffalo Congress, to be held in Wuhan on October 2022, including Organizing Committee, scientific program, hotels and touristic sites. Finally, Prof. Talat Pasha, presented the candidature of Pakistan with himself as IBF President, with the support of UVAS, University Veterinary and Animal Science in Lahore, the Buffalo Research Institute in Pattoki, the Ministry of Agriculture and the Province of Punjab. The IBF members were called to vote, each member one vote with secret ballot. The election committee, formed by Vittoria L. Barile, Antonella Chiariotti, Talat Pasha, Yang Ligu, read the votes with the following result: 33 votes to China, 17 to Pakistan. All the IBF members welcomed the new IBF President Prof. Yang Ligu, who thanked the IBF members for their vote.



THE NEW IBF PRESIDENT PROF LIGUO AND THE IBF SECRETARIAT

The day after, September 20, started with the invited lecture by Prof. Metha Wanapat from Thailand on the Fermentation efficiency, mitigation of methane for the sustainable buffalo productivity. Two sessions followed, the first on milk and meat production, the second on health and pathologies.

After lunch, the invited speaker, Prof. Bhuminand Devkota from Nepal presented his lecture on Keys to improving fertility on anestrus buffaloes around the year, an example from Nepal. Prof. Jose Fernando Garcia, from Brazil, presented the invited lecture on Functional genomics in the context of water buffalo improvement programs.

Two separated sessions were opened, one on reproduction, another on draft power and sustainable production.

At the closing ceremony, Prof. Soysal introduced the new IBF President, Prof. Yang Ligu.

The day after, September 21, the buffalo tour was held visiting different farms.



BUFFALO TOUR

The participants enjoyed the gala dinner in a cruise on Bosphorus.



Prof A. Borghese

General Secretary of IBF

The book of abstract of 12th World Buffalo Congress is available at this link

https://wbc2019.meetinghand.com/projectData/730/webData/WBC-2019-Book_Final.pdf

4th IBF TRAINING COURSE ON BUFFALO MANAGEMENT AND INDUSTRY



25 people from 15 countries visited CREA Center for Animal Production, Animal Prophylaxis Research Institutes in Roma and Napoli, Chiacchierini Bull Center, University of Napoli, CNR Institute for Animal Production Systems, 1 food market, 5 buffalo farms and 6 buffalo industries, receiving theoretical and practical lessons.

The full diary will be published as supplement of this newsletter in November.

BUFFALO'S PRODUCTION IN BOLIVIA

The first water buffaloes did arrive in Bolivia in 1974, thanks to a common project between the European Community (EU) and the National Institute of Colonization (INC), for productive development support to local settlers, located in the Paraíso community of the Municipality of Puerto Villarroel, José Carrasco province, of the department of Cochabamba. These 200 imported buffaloes were of the Mediterranean breed, coming from the region of Caserta, Italy, which purpose was addressed to both, to promote food security (meat and milk production), as well as for its use in animal traction. Subsequently, most of the imports have been carried out from Brazil, which main buffalo breeds were related to the Mediterranean, Murrah, and Jafarabadi.



ASOCRIABUF-BOLIVIA, ORGANIZATION OF BOLIVIAN BUFFALO BREEDERS ACTIVE IN THE AGRICULTURE FAIRS OF SANTA CRUZ AND COCHABAMBA.

After four years of follow-up, this donation had failures due to the fact that most of the farmers gave up raising buffalo, because their handling was very different from cattle. Later in 1978, the INC delivered eighty buffaloes and five males, to the Faculty of Agricultural and Livestock Sciences (FCAPyP) of the University Mayor de San Simón (UMSS), with the aim of preservation and to produce milk and meat at small scale until 2013. Additionally, research work on animal health and animal traction were carried out.

Only one of the local settlers who originally received the buffaloes continue raising them. Currently, this farmer owns 80 buffaloes of Mediterranean and Murrah breeds, destined mainly to produce meat, milk, and cheese at family and local level.

In 1977, Mr. Mariano Justiniano made a purchase of 70 buffaloes of the Mediterranean breed to the farmers of the Tropic of Cochabamba and took them to the department of Beni, as a

private farm for raising and producing milk and cheese. At present, this farm has a herd size of about 500 buffaloes, which annually sells close to 100 heads to promote buffalo's raising. This farm is also addressed to the production and the sale of milk.

Among other buffalo's breeders in the El Beni region, it is notable to mention the families Haab, Smith, Slink, Justiniano, Kulljis and Maluf; likewise, in the department of Santa Cruz, other breeders such as Kurd Haab and son, Roby Haab Chavez, Alfredo Pinto Landivar, Walter Kuljis, Mariano Justiniano, Frank Wenkler, Andres Ibañez. It is worth mentioning that in the Tropic of Cochabamba there are also buffaloes in the Fundo Valle Sacta, belonging to the University Mayor de San Simón, under the direction and handled by both Mr. Ángel Oporto and Mr. Efrain Chacon Condori.



TASTING AND SALE OF BUFALO' CHEESE AND CHORIZO MEAT PROMOTED BY ASSOCRIABUF-BOLIVIA

Buffalo breeders in the Cochabamba region market their products, such as meat and milk, locally and rarely at the state level. On the other hand, milk's production is mostly addressed either to sale or processing of mozzarella cheese or on a smaller scale to fresh, unripened pressed cheese. Regarding the buffalo's production of the regions of Beni and Santa Cruz, the production is mainly addressed to the sale of meat and milk locally as well as departmentally. Likewise, a new entrepreneur initiative is moving forward to privately selling in supermarkets. Additionally, it is important to mention that buffalo dairy products, such as mozzarella cheese, are only sold on a small scale because are not a product of interest by consumers, who prefer fresh cheese made with cow's milk.

Currently, Bolivia has a buffalo's population about approximately 35,000 heads. In 2017, the legal process was carried out for the creation of the Bolivian Buffalo's Breeders Association (ASOCRIABUF-BOLIVIA), which process, and management were in charge of Mr. Walter Kuljis as President and Mr. Efraín Chacón Condori as General Secretary until the achievement of the legal status. The legal status was obtained in the year 2018, giving formality to the newly created Bolivian Buffalo's Breeders Association (ASOCRIABUF-Bolivia). To date, Mr. Walter Kulljis is the current President and Mr. Luis Quiles acts as the General Secretary.



LEFT MR. WALTER KULLJIS, PRESIDENT OF THE ASOCRIABUF-BOLIVIA. RIGHT, MR. EFRAIN CHACON CONDORI, RESEARCHER AND RESPONSIBLE OF BUFFALOS PROJECT OF THE CATREN-FCAYP OF THE UMSS-BOLIVIA



MEDITERRANEAN BUFFALOES BRED ON PASTURE IN THE CATREN-FCAYP OF THE UMSS (TROPICO DE COCHABAMBA-BOLIVIA)



MEDITERRANEAN BUFFALOES WITH CALVES IN THE CATREN-FCAyP OF THE UMSS (TROPICO DE COCHABAMBA-BOLIVIA)



WATER BUFFALO ADAPTED WITHOUT ANY PROBLEM TO LOWLANDS OF THE TROPIC OF COCHABAMBA -BOLIVIA

Dr Efraín Chacón Condori

Researcher, Resp.Unidad Ganadera Catren FCAPyP- UMSS - Bolivia

INSIGHTS ON THE STATUS OF EGYPTIAN BUFFALO

The riverine buffalo breeds ($2n = 50$) has been recognized as a dairy animal, spread from the Indian subcontinent to the eastern Mediterranean countries including Egypt. In Africa, the buffalo population accounts for almost 2% of the global buffalo population particularly concentrated in Egypt. The number of buffalo population in Egypt is about 3.7 million head according to FAOSTAT (2017). Egyptian buffalo is not only considered as an important genetic resource with a great potential for milk and meat production, but it is also considered as the main dairy animal raised by small Egyptian farmers.



FIGURE 1. EGYPTIAN BUFFALO RAISED IN NILE DELTA

Buffalo contribution to milk production reaches 45-50% of the total milk production in Egypt. The Egyptian buffalo milk yield up to 2500kg in 305 days of lactation as reported by Shafik et al., (2017). Longevity of water buffalo ranges from 9 to 11 years of age, with a mean productive life of 6 to 8 calving in the Egyptian buffalo (Ibrahim, 2012). As indicated by Sallam et al. (2012), high levels of buffalo production are usually associated with high breeding efficiency accompanied by good management that maintain body condition score and avoid negative energy balance.

Buffalo is also accounted to be an important source of meat where it contributes about 35 to 40% of total meat production in Egypt, mainly through culled animals, and male calves, (MALR, 2017). Buffalo meat is regarded as a healthy red meat because of its lower fat and cholesterol

content. The lowest initial weight that could result in the best fattening performance is 120 – 150 kg reflected in the highest average daily gain (1.22 kg/d) with the best feed conversion ratio (7.44 kg DM/kg gain). In addition, average daily gain > 1 kg achieved the lowest cost of feed and total cost per kg gain, as reported by El-Attar et al., (2017).

Egyptian buffalo is also adapted to the environmental and managerial conditions in Egypt. The suitability of the buffalo to the Egyptian hot climatic conditions is shown to be achieved by



FIGURE 2. EGYPTIAN BUFFALO RAISED IN NILE VALLEY GOVERNORATES

morphological, anatomical and physiological characteristics (Omran 2018). Small Egyptian farmers prefer buffalo since they can use lower quality and less digestible feeds, making them easier to survive on locally available roughages. In addition, they have advantages over cattle such as resistance to common bovine diseases, quality of milk and meat products (Hamid et al., 2016).

Egypt is geographically divided into Upper Egypt (Nile Valley; NV) and Lower Egypt (Nile Delta; ND). Nile Delta and Valley is the main contributor of food and related to the agricultural area. Appropriate circumstances due to the presence of suitable environmental temperature within the Delta region allowed to setup livestock system hundred years ago. The effect of environmental factors on the numbers and distributions of buffaloes in Egypt is needed to be put on focus. The majority of buffalo are concentrated around the Nile Delta, where feed is more abundant. About 32.2% of the buffalo population is in the Middle Delta region and 22.4% is in the Middle Egypt region as reported by Fahim and Abou-Hadid., (2014). With respect to

the buffaloes' developmental pattern in Egypt during the beginning of the second millennium, a notable decrease of the buffalo population in both lower and middle regions of Egypt where a slight increase was found in Upper Egypt, Desert and New lands in the last few years. This observation might be related to the drought and desertification in rural and semi-rural areas (Hassanein et al., 2013).

Buffalo sub-populations in Egypt are mainly characterized based on geographical origin within the country, and mostly belongs to one breed (El-Kholy et al., 2007), with little documented phenotypic or morphometric differences that may help in characterizing these sub-populations. In a recent study, Omran et al., (2019), have shown that the recorded values for all the buffalo body measurement were found to be significantly higher ($P \leq 0.001$) for animals raised in the Nile Delta conditions (Figure 1) as compared to those raised in the Nile Valley conditions (Figure 2), and might be dependent on temperature humidity index (THI). Thus, THI may was found to be the most prominent factor responsible for variations in the animal's morphometric characteristics particularly skin color and thickness. The buffalo animals raised under ND condition had soft, short, heavy and harmonic hair where it was rough, long, slight and sparse for those animals raised under NV conditions.



THE BUFFALO QUARTERLY PUBLICATION, PUBLISHED IN SIMPLE ARABIC LANGUAGE

Features of buffalo farming system were reported in a recent study carried out in the Nile delta governorates, where the study show that family labor represented 100% of the farm labors. Two or more family members were working for the milk production and its interrelated processes. Besides, more than 69% of farms tended to practice meat production beside milk production. Women share an important activity such as milking and calves rearing in addition to interrelated activities, where more than 70% of buffalo farmers practiced both two activities (Fahim et al., 2018).

Natural mating was the most frequent method to breed female buffaloes. Applying artificial insemination (AI) was limited. The majority of farms had no

breeding bull for natural breeding. At the time of heat, a farmer accompanies his animal to a breeding bull kept in a neighboring barn paying a fee. More than 75% of farmers tended to use the same breeding bull. They chose the bull according to his reputation, place proximity and phenotype, respectively as reported by Fahim et al., (2018). Facilities for Egyptian buffalo

semen freezing, and preservation are available in few centers over the country. Imported semen of Italian buffalo was used in crossing with Egyptian buffalo with the purpose of enhancing different production traits (Ibrahim, 2012). However, studies showed that the cross F1 buffaloes were superior in terms of productive traits, whereas pure Egyptian buffaloes were best in most of the reproductive traits (Nasr, 2016). The study also appeared to indicate towards a contrary association between milk production and reproductive traits. Backcrossing was similar to F1 in terms of production and similar to pure Egyptian buffalo in terms of reproductive traits. Moreover, the results from a close study suggest that producers should be promoted to increase the back-crossing of animals in their farms with the intention of increasing milk production and ensure superior reproduction efficiencies with lower stillbirth incidence (Nasr, 2017). However, the uncontrollable use of AI with Italian buffalo's semen which is widely spread in the country is in urgent need for evaluation prior to genetic assessment for milk production and reproduction traits. Since it might cause unintended and unwanted outcomes of genetic modification of the Egyptian buffalo genetic resources (Fooda et al., 2011). Therefore, it was suggested by Allam et al., (2015), that more studies are needed for the productive, reproductive and genetic diversity of crossbred populations before the enhancement of crossbreeding activities on the national level.



DR. LAILA EID NASSER, HEAD OF THE EGYPTIAN ASSOCIATION FOR IMPROVING EGYPTIAN BUFFALO (EIAB) AND DR. TAREK FOODA DEPUTY OF THE EIAB DURING THE MONTHLY MEETING WITH SOME BUFFALO BREEDERS AND YOUNG RESEARCHERS.

Moreover, mixed farming system as cattle traditionally accompanied buffaloes raising are routinely used at small farms. Dairy herds were composed of 74% or 78% buffaloes and 26% or 22% cattle, respectively. The number of milking buffaloes represented the highest percentage in the herd structure. In addition, buffalo milk production was

permanently accompanied with cultivation. Small buffalo farmers had agricultural lands either owned, rented or both as reported by Fahim and Abdel-Salam (2018).

Buffalo feeding mainly includes clover, corn silage, rice straw, clover hay and concentrates feed mixtures, in addition to other plant residues.

Buffaloes were routinely milked twice daily. Hand milking was the common method at small holdings. Machine milking was only used in medium and big farms and did not exceed 2.1%.

Farmers retained a proportion of the total milk (liquid and dairy products) for home consumption. More than 70% of farmers manufactured milk to dairy products; more than 75.8%, 73.5% and 40.7% of farms produced cheese, butter and cream, respectively. Simple and traditional manufacturing manners were followed. Surplus raw milk was marketed directly to consumers and retailers through informal marketing system. Moreover, extra dairy products



MONTHLY MEETING WITH SOME BUFFALO BREEDERS HELD BY THE EGYPTIAN ASSOCIATION FOR IMPROVING EGYPTIAN BUFFALO WITH DR HAMED EL-AKHNAS RESPONSIBLE FOR REPRODUCTION AND ARTIFICIAL INSEMINATION AT THE GENERAL AUTHORITY FOR VETERINARY SERVICES.

were sold. In conclusion, small buffalo holdings provide a feasible opportunity for income to the household members (Fahim and Abdel-Salam,2018).

To pinpoint strengths and weakness in the buffalo production system in Egypt, the recording of performance data and pedigree at the small breeding units (small holdings; 2-5 heads) is considered as the driving force for management of a national plan genetic improvement. However, this notable step still exposed to great challenges such as financing and credit services, technical guidance for characterization, electronic identification tags and networks, in addition to policy-related constraints.



MEETING WITH SOME BUFFALO BREEDERS HELD MONTHLY BY THE EGYPTIAN ASSOCIATION FOR IMPROVING EGYPTIAN BUFFALO

Buffalo farmers, milk and meat producers, are sometimes misinformed about basic and applied knowledge in water buffalo breeding. Lack of knowledge in buffalo science such as physiology and genetics, behavior, environmental factors, and production might be resulting in great economic losses at the national level. Therefore, one of

the main goals for establishing the Egyptian Association for Improving Egyptian Buffalo was to empower buffalo breeders through courses, publications in simple Arabic language and presentations, field days, outreach programs or workshops on water buffalo reproduction,

production, disease prevention and marketing in addition to active extension programs that could be established through communication with the buffalo breeders.



HIS EXCELLENCY DR. MOHAMED SOLIMAN, HEAD OF AGRICULTURAL RESEARCH CENTER, GIZA-EGYPT, DURING THE OPENING CEREMONY OF THE SECOND CONFERENCE FOR THE EGYPTIAN ASSOCIATION FOR IMPROVING EGYPTIAN BUFFALO



HONOURING OF SOME OF THE PIONEERS IN THE BUFFALO BREEDING RESEARCH FROM THE ANIMAL PRODUCTION RESEARCH INSTITUTE AND EGYPTIAN UNIVERSITIES

Laila N. Eid

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Buffalo Breeding Research Department
Head of Egyptian Association for Improving Egyptian Buffalo*

AZIKHELI-BUFFALO-BREED OF SWAT-KHYBER PUKHTUN KHWA-PAKISTAN

INTRODUCTION & BACK GROUND

Azikheli buffalo is a unique riverine breed found in Khawazakhela Tehsil and its adjacent areas in district Swat since unknown times. The breed has very peculiar characteristics under unique traditional husbandry practices in comparison to the rest of the Buffalo breeds found in the country. This is relatively a smaller breed hence requires lesser space & feed than the large size buffalo breed like Nili Ravi, however milk production is comparable.

Majority of the Azikheli buffalos are housed in some close proximities characterized by darkness with no or poor ventilation and / or water trough facilities. Mangers are narrow and deep which cannot be cleaned properly. In a 10*10 square feet space more than 8 animals along with calves & bulls are kept.



AZIKHELI BUFFALO IN HIS HOME TRACT BINKAT SWAT

The animals are fed dried roughages like maize Stover, rice & wheat straw, poor quality traditional hay made from hills grasses locally called as Peshkallay and other crops by-products. In rainy season when green fodders are abundant some people used to offer that to their animals in a small quantity.

Commercial concentrates of various brands are available in the local market but the farmers are reluctant to use that due to unawareness, the two widely used concentrates ingredients wheat bran and cotton seed cake in combination with wheat flour or dried bread and wheat straw in equal ratios are mixed and fed maximum up to 3 kg each in the morning and evening during milking times locally called as Boothawa or Peera.

S.No	Physical Characteristics Of Azikheli Buffalo	
1	Body	Comparatively small stature which makes it suitable for the hilly area. Males have significantly longer bodies.
2	Body Color	color varying from complete albino to piebald to even black but the majority of animals has a brown coat color.
3	Face	Females have significantly wider faces at the level of the eyes than males.
4	Muzzle	White, black, black and white or black-pigmented to whitish-pigmented
5	Forehead	Completely white or white spotted extending to Nose Bridge
6	Eyes	Shiny blue or black eyes
7	Ears	Males have longer ears as compared to females
8	Neck	Females have significantly longer necks whereas Males have thicker necks.
9	Horns	Horns are sickle to semi-sickle appearance
10	Tail	Short and slender
11	Limbs	The limb varies from white below knee, completely white or black and white.
12	Udder	Fairly developed
13	Dewlap	Quite voluminous in male but comparatively less developed in females

Reference: Animal Genetic Resources, 2013, 52, 65–70. © Food and Agriculture Organization of the United Nations, 2013 doi: 10.1017/S2078633613000027

Albino and reddish brown are dominant skin colors found in Azikheli buffalo which attracts people due to which farmers do not allow everyone to visit his animals due to the common myth of bad eyes, animal can get sick and /or reduced milk productions. This factor mainly prohibits the farmers not to allow the animals to graze in the fallow land or orchards or in the hills. The breed has the ability despite of its heavy weight than the cows to climb on the steep hills.

The average milk production under the aforementioned practices at farmer level ranges from 5-6 liters /day, however some exceptional buffalo can produce up to 16 and 18 liters as per

statements of the local farmers. The animal has great potential for milk and meat production which could be exploited many folds through modern husbandry practices.

Natural breeding is common due to the fact that majority of the Azikheli buffalo's farmers do not like the inseminators to rectally palpate their animals. Every farmer also does not keep pure bull for the purpose being economically a challenging task; on the other hands this practice can be instrumental in the spread of a zoonotic disease like brucellosis. Need not to mention here that neither fresh nor frozen semen of Azikheli bull are available at the moment in the field. The female is very much fragile while male is reasonably agile & seldom used for draft purposes.

Azikheli Buffalo is a docile animal and even children and women can comfortably handle them, being a domestic animal, hence show great affinity to the house hold & react to the strangers aggressively. Well-fed males and even female can serve as good beef animals, especially for sacrificial purposes. The average body weight ranges between 350-450 Kg while average age at first calving is 45 months with the lactation period of 300 days. Average Fat % found in milk is 6.5 and the taste of milk, yogurt and ghee is quite pleasant.



AERIAL VIEW OF AZIKHELI BUFFALO FARM CHARBAGH SWAT

Azikheli buffalo has excellent fertility record at community level wherein it produces a calf each year and the average calving interval is 1.5 to 1.8 year. Though insemination or natural bulling before 40 days after parturition is not recommended due to the process of involution but farmers do not care the same and get them pregnant successfully.

The animal is well adapted to the local weather conditions however cannot with stand to blistering sunshine in summer. Exposure to extreme cold weather in winter could cause cracks on their skins and hence change takes place in body color. Thus, they need to be protected in either condition.

The breed has remarkable resistance to diseases. A base line survey conducted by the staff of the project with the Azikheli buffalo farmers and collected the following tabulated diseases prevalent in the area along with local names and remedies.

COMMON LIVESTOCK DISEASES PREVALENCE IN THE AREA

<i>Viral/ bacterial diseases</i>		
Name of Diseases	Local Name	Local Treatment
FMD	Tabaq	Washing of the affected areas with soft water and feeding of hot oiled bread.
H.S	Gota	Bhung & arand leaves+ gurh and black tea leaves boiled together and feed that to the animal.
Black Quarter Disease	Topake	Bhung & arand leaves+ gurh and black tea leaves boiled together and feed that to the animal. Mud and water boiled together and apply to the affected areas.
Anthrax	Nasapa	Nil
Enterotoxaemia	Baqey	Saunf+welanay+Gurh+Tea leaves boiled together and feed that to the animal.
Pleurophnemonia	Taba	Spaerkai+grurh+boiled water.
Three days sickness	Shaley	Paracetamol+spaerkai+saunf+gurh mixed with flour and feed to the animal.
<i>Parasitic Diseases</i>		
External		
Mange/ Mites	Kharish/ Pum	Application of used mobiloil
Ticks (hard and soft)	Koni	Snake skin with flour as a bolus
Internal		
Fasciolosis (liver flukes)	Joka	Kambela jar
Roundworms (ascariasis)	Da kolmo chinji	Nilatota (copper sulfate)
Lungworms (strongyloidiasis)	Da parpos chinji	Nilatota (copper sulfate)
<i>Nutritional disorders</i>		
Calcium deficiency (milk fever, rickettsia)	Shelly	Gurh and chini (sugar)
<i>Management oriented problems</i>		
Mastitis	Sarkhubad	Takoor
Reproductive disorders	NA	NA



DISCUSSION WITH AZIKHELI BUFFALO PROGRESSIVE FARMER SAMBAT SWAT

The Azikheli buffalo breed is, however, on the verge of extinction due to inappropriate crossing over with the local non-descript and/ or with Nili Ravi. Furthermore, huge numbers of Azikheli buffaloes were lost due to insurgency in the region in the years 2006 to 2009.

Keeping in view the above factors and peculiar characteristics, it is imperative to undertake conservation & development process of this indigenous buffalo breed not only to save it from disappearance but also to enhance the natural profile of the province and the country. Through strong advocacy and/ or strong applicable extension services in the field could help the farmers for sustainable use of its genetic diversity to ensure its conservation & development which would also pave the way to evaluate its performances under traditional and improved management conditions.

Department of Livestock & Dairy Development (Ext) very precisely came off with a proposal on this issue and presented to the provincial Government to conserve and further bring improvements in its production parameters. A PC-1 amounting to Rs120.000 million, (financial year 2014-15 to 2017-18 & 19) out of which Rs.38.300 million specified as capital cost while Revenue cost Rs.81.700 Million, was approved by the provincial Developmental committee to establish a nucleus herd of the Azikheli buffalo at Alla Abad 1.5 Km inside the campus University of Swat on the Government land.

OBJECTIVES OF THE PROJECT

- To conserve the indigenous Azikheli buffalo breed in its home track.

The above objective is assumed to be achieved through the following main activities:

- I. Construction of buildings & infrastructure for improvement & conservation of Azikheli buffaloes at Charbagh, District Swat.
- II. Procurement of true to type Azikheli Buffaloes to maintain a nucleus herd of Azikheli Buffaloes.
- III. Organizing the Azikheli buffalo farmers and creating awareness amongst them to keep the breed pure and evaluate best producers through culling & selection process both at community I and Farm level.
- IV. Selection of best bulls for semen production to make it available at community level to overcome the shortage of bulls and avoid random crossing over of the breed with the other breeds.

ESTABLISHMENT OF NUCLEUS HERD

A nucleus herd of 37 buffaloes and two bulls true to type Azikheli breed have been established majority of which are pregnant wherein 14 buffaloes' have given birth. They are kept loose in the sheds and eating / drinking freely whenever they like. Sheds have been provided with cubicles and paddocks for their comfort.

Mangers are shallow and at ground level wherein maize silage @ 25 kg mixed with 5 kg wheat straw per animal are offered three times a day. The milking animals are fed concentrate feed 4 kg per animal per day while the pregnant being near to parturition are offered 1 kg each to fulfill its requirements and accustom them with the feed.

So far easy parturition had taken place, 50% male & 50% female calves have been obtained. Unlike the Nili Ravi Buffalo breed of Punjab, these buffaloes do not bother about their calves and produce milk without suckling of their calves.

Calves at the age of 3 days are separated from the dam, kept in calf boxes and fed with milk through bucket @10% of its live body weight along with good quality hay and 24 hours' fresh water. Average birth weight of the calf is 35 kg.

Average milk production recorded is 8 liters per day per animal & the individual peak production recorded is 10 liters per day per animal at Farm.

All the animals have been protected against foot & mouth (FMD) and Hemorrhagic septicemia (HS) through vaccinations.



AZIKHELI BUFFALO CALF IN AZIKHELI BUFFALO FARM CHARBAGH SWAT



AZIKHELI BUFFALO IN HIS HOME TRACT SHAMAK SWAT



AZIKHELI BUFFALO TAKING SILAGE FEED AT AZIKHELI BUFFALO FARM CHARBAGH SWAT



AZIKHELI BUFFALO TAKING REST IN CUBICLE IN AZIKHELI BUFFALO CHARBAGH SWAT



AZIKHELI BUFFALO IN Paddock AT AZIKHELI BUFFALO FARM CHARBAGH SWAT

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CURRENT STATUS AND FUTURE CHALLENGES OF BUFFALO PRODUCTION POST-CENTENARY OF ITS INTRODUCTION IN VENEZUELA

The water buffalo was introduced to Venezuela in 1920 by General Juan Vicente Gómez, who imported from Trinidad and Tobago a batch of twenty-six females and two males; but it was not until the 1970s that its relevance as a species of zootechnical interest to the production of animal protein in Venezuela had begun (Montiel-Urdaneta, 2008).

Following the death of General Gómez (1935), the few buffaloes that had entered the country, practically disappeared (Montiel-Urdaneta 2008). Later, several buffalo imports were done again from Trinidad and Tobago during the 1960s-80s decade and interestingly some imports in 1975 and 1976 came from Australia.

Subsequently, other imports from Europe, specifically from Bulgaria (1978, 1984, and 1992) and Italy (1975, 1976) joined to contribute to buffalo genetic diversity in Venezuela and its improvement in the later years after its introduction. Likewise, the more recently imports from Brazil (2008) of Indian-Murrah pure breed have contributed to such improvement remarkably as well.



DAIRY BUFFALOES (MEDITERRANEAN X MURRAH) GRAZING IN ONE OF THE MAIN REGIONS FOR BUFFALO'S RAISING IN VENEZUELA IN THE SOUTH REGION OF MARACAIBO LAKE "SUR DEL LAGO DE MARACAIBO" (J.C.GUTIÉRREZ-AÑEZ PHOTO 2015; HERD: C.A., TATUY, SANTA ELENA DE ARENALES, MÉRIDA STATE)

On the other hand, other genetic improvement endeavours which have contributed to the Venezuelan buffalo development, were driven thanks to the first imports of semen made from Bulgaria (1992), from Brazil (1996, 1998, 2002, 2010), and Italy, from where semen has been imported for many years until the current date.

The variety on the country-origin of the different imports (Trinidad and Tobago, Australia, Bulgaria, Italy, and Brazil) made to Venezuela have had influenced interestingly the mixed racial of the Venezuelan Buffalo. It is common to observe diffuse racial characteristics mainly from breeds as Murrah, Mediterranean, Bulgarian Murrah, Jaffrabadi, Nili-Ravi, Surti even atomized-traits of Carabao (due to the imports coming from Australia) in some animals.

Nevertheless, nowadays, most of the buffalo population in the country have been well defined towards either Murrah or Mediterranean or crossbreed derived from both, thanks to the genetic selection and remarkably to the use of those breeds in pure state either through the artificial insemination (AI) or through natural mating by using bulls produced by AI in recognized farms that have been using that biotechnology as a genetic improvement tool for 25-30 years.



CROSSBRED MEDITERRANEAN X MURRAH PREGNANT HEIFERS COOLING IN AN ARTIFICIAL WATER CHANNEL IN THE BIGGEST BUFFALO FARM FROM VENEZUELA (22.000 HEADS) LOCATED AT THE SOUTH REGION OF MARACAIBO LAKE (J.C. GUTIÉRREZ-AÑEZ PHOTO 2016; HERD: BUFASUR, SAN CARLOS, ZULIA STATE)

It is important also to highlight that the first pure Murrah *in vitro*-derived embryos from Brazil were imported and successfully transferred into recipients, producing the first Ovum Pick up (OPU) and *in vitro*-derived embryo transfer (ET) calves in 2014, the endeavor in which our Institute was a part.

Currently, it is difficult to specify with accuracy the exact buffalo's population in Venezuela, given to the uncertainty of governmental official statistics, and the absence of an official program of records.

According to the last FAO data available, Venezuela's buffalo population was second after Brazil among the countries in the Americas, with approximately 200,000 heads (Borghese, 2005). Later, in the book Buffalo Livestock and Products, edited by Professor Borghese (2013) it is mentioned that in 2012 Venezuela continues to occupy the second position in the Americas after Brazil with an estimated population of 350,000 heads.

However, the Venezuelan Buffalo's Breeders Association (CRIABUFALOS), which counts on records of 500,000 animals and more than 190 members, estimated that the total herd in Venezuela is between 1,800,000 and 2,000,000 heads considering non registered independent breeders (Nicola Fabbozzo, President of CRIABUFALOS, personal communication).



**YOUNG MURRAH BULLS PREPARED TO A LIVESTOCK EXHIBITION AND AUCTION
(MANUEL MAZZEI PHOTO 2015; HERD: AGROPECUARIA CANTARRANA, VENEZUELAN PLAINS "LOS LLANOS" AT THE
SOUTH-WEST OF THE COUNTRY, BARINAS STATE)**

Barring two states, the Capital District (Caracas) and Margarita Island, the buffalo population is distributed across the whole Venezuelan territory (Montiel-Urdaneta, 2008), which reflect the good adaptation of this species to different ecosystems. Venezuela's ecosystems throughout the country seem to be conducive for buffalo production, which has given this animal a privileged position in terms of protein contribution vis-à-vis other livestock species, despite the worst economic and political situation ever faced in the country in the last century.



A PRACTICAL SECTION ON REPRODUCTIVE TRACTS DURING THE SECOND ARTIFICIAL INSEMINATION'S TRAINING COURSE IN BUFFALOES, ORGANIZED BY THE RESEARCH UNIT OF ANIMAL REPRODUCTION FROM THE UNIVERSITY OF ZULIA (JUAN CARLOS GUTIÉRREZ-AÑEZ PHOTO 2016; HERD: BUFASUR, SANTA BÁRBARA, ZULIA STATE).

The growth rate for the buffalo population in Venezuela is around 15%, which would mean an increase of 270.000-300,000 heads per year, considering the current estimated population (CRIABUFALOS estimation).

One important factor which has contributed to the exponential rise in buffaloes in Venezuela is the shift in preference of farmers from cattle to buffalo production due to several favorable features in the latter.

Many of the new buffalo breeders come from the cattle industry, who have taken advantages of their previous experiences combined with the large-scale investments existing in their farms,

which has favored the shift towards buffalo farming given their superior benefits in terms of production and profitability.

The better environmental adaptation, the greater resistance to diseases, the better nutritional conversion of fodder, added to the superior reproductive performance and better growth rate observed in buffaloes under tropical conditions as compared to cattle were the main driving forces favorable for buffalo farming in a country with a serious economic crisis.

Buffalo's farms in Venezuela are often large properties (from 1,000 to 10,000 hectares, even higher), but it is also common to observe on a small scale of raising (< 100 hectares) with a different number of animals depending upon the farm size (from 100 or less up to 22,000 heads).

The management and feeding are mainly entirely grazing-based, but it is increasingly common to observe more sophisticated feeding systems with strategic supplementation based on fodder, silage, and specialized feeding according to the animal's nutritional requirements.

Buffalo livestock purpose in the country has used for both milk and meat production. However, in recent years there has been an exponential growth and interest in milk production, which has led to improvements in technologies for milking and for milk storage systems. Almost all milk production is destined for the dairy products processing industry, mainly cheese making.

The milk yield per cow is widely diverse from one farm to another, but generally, it oscillates around 1,400 Kg per buffalo per lactation (range: 1,200 to 3,500-4,000 Kg/cow/lactation), which length could extend until 270-310 days.

Nowadays, one of the main challenges for buffalo production in the country is facing the current distorted economy, characterized mainly for constant inflation, shortage of agricultural inputs for production, which despite these circumstances allows achieving a balance in the remuneration of products derived from buffalo production. Similarly, government inaction regarding the sanitary problems and the absence of a national program of record and development or at least a clear governmental politics framed to address a national buffalo development program, which could include all sides involved such as government, universities and the different buffalo breeders association seems some of the biggest challenges to overcome.

Despite the limitations as mentioned above, currently the buffalo importantly contributes to the economy and food security by providing items for the food chain, such as meat, milk and processed dairy products like different types of cheese (fresh cheeses, such as mozzarella, pasteurized and artisan cheese), in addition to yogurt, milk cream etc. In Venezuela, buffalo products are daily increasingly valued by both industry and consumers as well. Currently, one liter of buffalo milk has remuneration in the industry of around 40% above the price of cow's milk.

Concerning to the meat, in a country with production deficit and critical food providing and nutritional issues still to solve in a significant portion of the population, the production of buffalo meat could represent an important alternative to supply high-quality protein of animal origin to less cost.

The main advantage to produce buffalo's meat under tropical conditions, it is directly related to their higher efficiency in terms of time to reach the ideal slaughter weight (425-550 kg) at the age of 18-28 months old, due to their greater capacity to convert forages and gain weight than

that obtained with cattle through feeding-based on natural pasture. At present, buffalo livestock activities contribute to about 400,000 and 100,000 tons of milk and meat, respectively to the Venezuelan food market annually (CRIABUFALOS estimation).



ULTRASONOGRAPHY PERFORMED ON A BUFFALO COW DURING THE TRAINING COURSE ABOUT BUFFALO'S GYNECOLOGY AND REPRODUCTIVE ULTRASONOGRAPHY, ORGANIZED BY THE RESEARCH UNIT OF ANIMAL REPRODUCTION FROM THE UNIVERSITY OF ZULIA AT BUFASUR FARM (J.C. GUTIÉRREZ-ANEZ 2017)

In Venezuela, Buffalo Breeders, Academicians, Scientists, Technicians, and Buffalo lovers, in general, are very enthusiastic about buffalo activity. Routinely are organized various events throughout the year that usually gets a sound public response.

The different livestock exhibitions, symposiums, workshops, regional and national assemblies and various training programs that cover various aspects of buffalo production like management, nutrition, health, reproduction, and biotechnologies, show promising growth for the buffalo industry amidst the current existing difficulties.

In particular, our research unit has carried out for the first time in the country different training courses aimed to train technicians specialized in buffalo's reproduction, and other Assisted Reproductive Technologies (ART) applied to the species.



OVUM PICK UP (OPU) SESSION PERFORMED ON A BUFFALO COW DURING OPU-TRAINING COURSE ORGANIZED BY THE RESEARCH UNIT OF ANIMAL REPRODUCTION FROM THE UNIVERSITY OF ZULIA AT BUFASUR FARM (JUAN CARLOS GUTIÉRREZ-AÑEZ PHOTO 2017)

Standing out among these, we have organized the courses on artificial insemination, gynecological evaluation, reproductive ultrasonography, as well as embryo technology including ovum pick up (OPU) and *in vitro* embryo production.

Furthermore, during the last five years, our department has focused the research on the area of reproductive biotechnologies, mainly related to improving the efficiency of estrous cycle manipulation for both fixed-time artificial insemination (TAI) and embryo transfer programs using proven semen from Italian Mediterranean and Murrah Indian bulls.

The results of this research have allowed us to develop tropical-adapted fixed TAI protocols in water buffalo with efficiency and adequate pregnancy rate during conventional breeding and non-breeding seasons. This program has covered over 5,000 artificial inseminations performed throughout the country in different regions and farms, which has allowed us to analyze the different factors which could compromise its efficiency, besides enabling to educate farmers about artificial insemination and other aspects of buffalo production.

On the other hand, additional outcome of this program has been the generation of valuable information for our farmers, which they are taking to improve their livestock, accelerating the

genetic progress through this technique, as well as the reproductive efficiency; which will allow increasing the milk production, productivity, and profitability of their herds.

Finally, the consolidation of a genetics improvement program through reproductive biotechnologies and as well as through genomics selection of buffalo herds between our Institution and the Venezuelan Buffalo Breeders Association (CRIABUFALOS), promises to improve some special traits.

However, those research and development efforts are not enough to cover other issues of buffalo production concerns such animal and public health (one health), nutrition, management; socio-economics including economic production, industrialization, and commercialization, etc., which could only be addressed in a multidisciplinary national program involving government, the breeders associations, public and private research institutions.



FIRST BUFFALO'S CALVES PRODUCED THROUGH OPU-IVF AND EMBRYO TRANSFER IN VENEZUELA
(JUAN CARLOS GUTIÉRREZ-AÑEZ PHOTO 2014; HERD: BUFASUR, SANTA BÁRBARA, ZULIA STATE)

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WORLDWIDE BUFFALO ACTIVITY

IBF 2022

13th WORLD BUFFALO CONGRESS

October 10th-13st ,2022

Wuhan-China



武汉,每天不一样!
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Huazhong Agricultural University (HZAU) is a national key university of “Project 211” directly under the Ministry of Education. With a history tracing back to Hubei Farming School founded in 1898 by Zhang Zhidong, governor of Hubei and Hunan province, HZAU enjoys a history over 120 years. The university was entitled National Civilized Unit in 2008 and 2011 and was ranked 11th in the nation among the 72 MOE universities in the latest Performance Appraisal in Higher Education by China’s MOE National Institute for Education Research. Besides, HZAU is ranking the second place of all universities in China in agriculture.

In addition to Huazhong Agricultural University, there are other 6 local Institution / organization will support the 13th WBC, including Chinese Association of Animal Science and Veterinary Medicine, Dairy Association of China, Dairy Association of Hubei province, China Animal Agriculture Association, Buffalo Research Institute of Chinese Academy of Agricultural Science and Guangxi Zhuang National Autonomous Region, Guangxi University, Modern Agricultural Industry Technology System (Dairy Cattle).

13th ENCONTRO BRASILEIRO DE BUBALINO CULTURES



The Brazilian Buffaloes Breeders Association (ABCB) will hold the 13th Brazilian Meeting of the Buffaloes Breeders in Natal, Rio Grande do Norte, Brazil from October 23-26, 2019 and is the most comprehensive buffalo meeting in the country as a national forum for breeders, professionals, educators and students.

The registration fee includes the digital certification, free Wi-Fi in public areas of the convention center, oral session with will address issues associated with buffalo breeding and production, coffee breaks and "Buffalo Day" at the TAPUIO® farm (happy hour with cheese and buffalo meat).

We hope that the 13th Brazilian Meeting of the Buffaloes Breeders in Natal will be a great opportunity to meet and socialize with colleagues and friends. We welcome you and wish you a pleasant stay in our country!

More information in: <http://encontrodebubalinocultores.com.br>

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