

# Buffal Newsletter



Number 41 January 2024

**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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## FROM THE EDITORIAL COMMITTEE

In the scientific focus section, we are presenting two papers about the situation of buffalo in Panama and Bolivia and the special issue containing the 13<sup>th</sup> WBC proceedings.

In the Report section are included short summaries of the 13<sup>th</sup> world buffalo pre-congress workshops on Reproduction and assisted reproductive technologies in buffaloes workshop, Buffalo meat products & industry workshop, Buffalo industry and dairy products workshop, Animal welfare workshop. A synthetic description of the 13<sup>th</sup> WBC and the post-congress buffalo tour are also reported.

In the upcoming event section you have the invitation to the first international conference on Buffalo Mozzarella and Milk Products, in Naples on September, 2024; the 11<sup>th</sup> Asian Buffalo Congress in Dhaka, on October 2024, the XI Buffalo Symposium of the Americas and Europe in Bolivia in 2025, 14<sup>th</sup> World Buffalo Congress in Naples, Italy in 2026.

As you can see the graphical version of the has been changed and from this number it will have an ISSN. Hope you enjoy.

The IBF Secretariat worked to maintain connections and support to associates. Other requests to become members were examined, reaching 174 IBF associates, representing 36 countries.

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# THE WATER BUFFALO IN PANAMA:

## History, trends, perspectives, challenges and tasks for the future sustainable production

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### Abstract

The water buffalo (*Bubalus bubalis*) was introduced in Panama in 1970 as imported from Trinidad and Tobago. The tendency of water buffalo production in Panama was irregular in the following 40 years. In fact, the national agricultural census officially declared a population of 2,401 buffaloes and 90 producers in Panama at the year 2011. There have been some recent advances combining the government, water buffalo producers, the National University Austral of the Chaco from Argentina with the international participation and leadership of the AMEXBU (Mexican Association of Buffalo Producers), ABUAR (Association of Production and Development of Buffalo in Argentina) and ANABUPA (National Association of Buffalo Producers of Panama). Those efforts have given support to develop the First Seminar on Water Buffalo Production in Panama organized by the Agricultural Ministry through Mr. Alfredo Valderrama in coordination with the Director of the National Cattle Production Program (Dr. Abelino Ureña). Applied research has emerged as one alternative to evaluate processes such as the growth and development of buffalo in the Atlantic Region of Panama. Results have demonstrated the need for technical improvements in feeding, nutrition, and animal health during the first 36 months in the life cycle of buffaloes. The research showed a considerable proportion of animals with smaller body weight, lower hemoglobin, and low eritrocyte count as compared to biological patterns in water buffaloes. Perspectives, challenges, and tasks are considered important at this moment, in order to develop and improve the water buffalo production system forward to efficiency and sustainability in Panama. There are many regions, whose climatic and geographic conditions are appropriate for water buffalo production, which are located in Bocas Del Toro, Chiriqui, Veraguas, Colon, Darien, Panama, Coclé, and Gnobé Bugle County. The future of the water buffalo production system in Panama will depend on efforts made by the government, buffalo producers, the meat and milk industry, and traders in order to offer beef and milk products, which Panamanian consumers must know and find with reasonable prices in the national marketing. Of course, the priority in this direction demands economic support to establish and develop a National Buffalo Production System toward efficiency and sustainability as there is in other countries. Main achievements will depend on the integration of buffalo producers to consumers; but under the supervision and leadership of the government to support those requirements that are not availa-

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ble for producers, industry, and traders. This animal production system must be economically nourished and assisted with education, researching, and extension to achieve development, growth, and efficiency toward a sustainable animal production in Panama.

**Keywords:** Bioclimatic zones, Buffalo production, Efficiency, Sustainability, Population, Panama



## History of water buffalo in Panama

The water buffalo (*Bubalus bubalis*) was introduced in Panama by military General Omar Torrijos Herrera in the decade of 70s. The first 21 animals from Trinity and Tobago arrived at San Jose Del General, District of Donoso, in the Region named Coclesito, Province of Colon. Those animals were donated by the Panamanian government to poor people in Coclesito, Province of Colon. The project named “Bufalino Agropecuario y Agroindustrial para la Habitabilidad Del Área Atlántica” was designed by Omar Torrijos Herrera and the main purpose of the project was to promote and develop the

Panamanian Caribbean Region, which was considered the axis for the economic activity in the region.

In this view, the water buffalo should guarantee products such as milk and beef for poor people with extreme economic limitations (Colmenares, 2016). In addition, those people were living far away from urban places; and therefore, they were not able to visit frequently commercial stores in the region.

At the beginning of the 80s, the buffalo population in Coclesito, Province of Colon was 206 animals. The Com-

pany named Bocas Livestock in Bocas Del Toro had 37 animals, in addition to some other small animals not counting for instances. In the meantime, there were buffaloes in Chepo (Province of Panama) and the National Institute of Agriculture (INA), located in Divisa City, Province of Herrera. Other water buffaloes were developed in the Province of Panama by private producers through the Hydroelectric Project El Bayano by the Bayano Corporation. From this place, some animals were moved to Coclé, Veraguas, Chiriqui, and Bocas Del Toro as part of the animal mobilization in Panama.

Water buffalo inventory in 1981 reached 300 animals, which demonstrated the high capacity to adapt to low land with a high precipitation regimen, (Colmenares, 2016). Those areas were not suitable for developing beef and dairy cattle production. Therefore, water buffalo was introduced and became well adapted to low-quality forages, high humidity, high precipitation, and high temperatures.

The Agricultural Company Sheré Punjab, S. A. property of Narinderjit Singh Dhaliwal (from India) was created and located in El Llano, District of Chepo, Province of Panama. This Company initiated a small project using animals from the Bayano Corporation.

The main objective was to produce buffalo and cattle milk to process. The commercial water buffalo company was initiated in the Province of Chiriqui in 1998, when Don Guillermo Cardenas Pelaez acquired 300 female water buffaloes from the Araúz family, located in Penonome, Province of Coclé. Mr. Cardenas from Colombia knew the advantages of water buffaloes for meat and milk production. A year later, this herd was transferred to Bocas Del Toro, where these animals and 5000 cattle were quarantined because of Tuberculosis in Bocas Del Toro. This action justified to sacrifice of many animals and the herd was eliminated in 2007.

This health procedure sacrificed 1300 buffaloes; lowering the water buffaloes population in Panama, (Colmenares, 2016).

There was a mutual agreement between buffalo and cattle producers with the government authorities in order to eradicate bovine tuberculosis in the region and the country. This decision diminished the economic

and technical efforts of producers, reducing the population. However, it was necessary to guarantee cattle and buffalo health in the Province of Bocas del Toro, as well as in other provinces across the country. The control of this disease has been maintained until today.

The Company Palm Oil Overseas Inc. imported in 1999 a total of 22 buffaloes (13 females and 9 males) from The Zamorano Agricultural School. The same Company continued gathering female buffaloes from Panama and Colon; as well as from other small herds distributed in the Chiriqui Province until it reached 250 females. This herd supports the development of a new herd developed in the District of Chiriqui Grande, Province of Bocas Del Toro. Later in 2003, the Group Athanasiadis through Ganadera Atlántica acquired 33 females from Costa Rica, and then the buffalo activity took place in Punta Robalo, District of Chiriqui Grande in Bocas Del Toro.

Another water buffalo farm was placed in the District of Changuinola in the Province of Bocas Del Toro, whose owner Professor Juan Rodriguez acquired 30 females and one male from Chiriqui Province. The same company continued incorporating female buffaloes coming from the Company Shere Punjab S. A. in 2015; which was located in the District of Chepo in the Province of Panama. The company worked until the buffalo population reached 137 females and 2 males for reproduction. The



province with the highest buffalo population is Bocas Del Toro, followed by Chiriqui Province, (Colmenares, 2016). Nevertheless, there is a fast-growing buffalo population in the Province of Darien, where we will find a great part of the water buffalo population in the following years since the bioclimatic conditions and the ecosystem favor the establishment of new buffalo producers.

## Actual situation and perspectives for the future of water buffalo

The ANABUPA was founded in the year 2022 and its actual president is Professor Juan Rodriguez. The buffalo inventory in Panama has been estimated at 15,000 animals (Panama America, 2023).

The prevalent breed in the water buffalo herd in Panama is the Buffalypso, which comes from Trinity and Tobago. This breed was developed by Dr Bennett (Fonseca, 2016) after using the genetic improvement program for milk and meat production based on breeds such as native buffalo in Trinity and Tobago, Murrah, and Jaffarabadi. Therefore, one can find animals that look like Murrah, Jaffarabadi, and Buffalypso. The main herds in Panama are using the Mediterranean breed and crossbreed based on the Mediterranean Breed from Costa Rica and Guatemala and Mexico. Those countries are using different protocols for genetic improvements based on artificial insemination, which allows them to speed up the genetic improvement and introduce other breeds like Murrah, Mediterranean, and sometimes Jaffarabadi.

All products and derivatives coming from water buffalo in Panama are commercialized as Beef Cattle or Dairy Cattle but without additive values. Our feeding culture in Panama is more familiar with poultry, swine, and cattle; rather than buffalo. Milk from buffalo is processed in some small industries; however, some produce cheese, yoghurt, conserves and sweets.

The Minister of Agriculture Mr. Augusto Valderrama has mentioned all activities and works toward



improving the water buffalo production in Panama. This concept was mentioned during the first international seminar on water buffalo production, which was held in Santiago City, Province of Veraguas, Republic of Panama.

It is important to mention that the National Livestock Direction through the Agricultural Ministry organized the first national seminar on buffalo production in Panama, which was attended by 80 people including professionals, producers, and agricultural students. The lecturers in this seminar included: Mr. Ismael Coronel Sicairios from Mexico, who gave a conference related to the History of Water Buffalo in America in representation of the Mexican Association of Water Buffalo Production (AMEXBU). Another speaker was Ms. Angelica Pluchino Arias from Costa Rica, who gave a presentation on statistical data in water buffalo production systems. Professor Dr Gustavo Crudeli, an expert in water buffalo from the National University of Chaco Austral (UNCAUS), gave a conference on general biology, reproduction, nutrition and management of water buffalo.

Dr Dimas Espinoza, representing the Agricultural Ministry of Panama (MIDA), presented the industry and commercialization of buffalo meat in Panama. Research is one of the new fields in buffalo production in Panama. The first research project has been conducted to evaluate the growth and blood patterns in the first 36 months in the life cycle of water buffalo raised in the Atlantic Region in the Province of Bocas del Toro. This study demonstrated that males reached 85.78% of normal body weight reported by Echeverri et al. (2014) and 55.9% of body weight according to Fundora (2015). In the meantime, females also showed lower body weight during the first 36 months of age. A health problem was detected because there was a high percentage of animals that presented low both hemoglobin content and erythrocyte count (Vanegas et al., 2018). Consequently, those results suggested a great need to insert better livestock practices to improve nutrition, feeding and health control and prevention in the water buffalo herd in the Atlantic region in Bocas Del Toro (Araúz et al., 2023) to improve production and productivity.

In the academic scenery toward higher education in agriculture, the Livestock Department and the Faculty of Agricultural Sciences at the University of Panama have included in the academic bachelor program for livestock production a new topic named BUFFALO PRODUCTION. This academic improvement responds to the importance that this ruminant species is gaining around the world. This inclusion is part of the changes and adjustments in the academic programs in animal production to achieve accreditation in the Faculty of Agricultural Sciences. Those changes responded to new demands and wide requirements for improving livestock production and sustainability. The course in Buffalo Production will allow us to teach principles and techniques to improve the knowledge and impact the environmental technology for improving production and efficiency in Panama.

There are other academic alternatives such as a Diploma in Buffalo Production, which was devel-

oped with the participation of experts in Buffalo Production from Argentina (Dr Gustavo Crudeli, Dr Exequiel Patiño, Dr Gladis Rebak, M.Sc Hugo Altamirano), from México (Mr. Coronel Sicairos), from Nicaragua (Dr Bryan Mendieta) and Panama (Dr Reynaldo de Armas and Mgter Edil E Araúz). The Argentine experts have built an academic content for a Diploma in Buffalo Production in coordination with the Livestock Department of the Faculty of Agricultural Science at the University of Panama in coordination with Professor Edil E Araúz as assigned by the Dean of the Faculty of Agricultural Sciences Professor Mgter Eldis Barnes. This academic work has formulated the Structural Academic Program for the first Diploma in Buffalo Production in Panama.

The Diploma includes modules in nutrition and feeding, reproduction and management, economy of buffalo production, reproductive biotechnology, physiology and environmental requirements for buffalo welfare and production, health and preventive diseases, and dairying and processing, milk and meat industry. This academic option is programmed for professionals, agricultural technicians, buffalo producers, and students from agronomy and veterinary sciences.

The economic requirements for the Diploma are also defined, the content of each module and professors are also ready to start giving the seminar in the faculty of Agricultural Science at the University of Panama in Chiriqui Province. However, we the organizers are waiting for a positive answer from the government to receive the economic support to start the implementation of the first Diploma in Buffalo Production in Panama. We think this economic support not only will allow us to increase the knowledge and technical capacity to improve water buffalo production in Panama but also represent a stimulus to all those producers who have believed in the livestock production system based on the idea initiated by Omar Torrijos Herrera about 53 years ago. We can say this "Let us make a better future using the right history by

improving knowledge, conditions, and programs to secure animal foods in Panama.”

Essentially, the buffalo population in Panama will increase in the next ten years. If we use the actual population of 12,000 buffaloes and the annual organic growth factor of 13.1%, indicated by Crudeli (2011), we can predict a population of 46,480 animals in the year 2033. This represented an increase of 3.87X over the actual buffalo population in Panama. This population does not include animals that may be acquired by importing from other countries for genetic improvement.

There are many reasons and motivations, that integrate the buffalo producers, the government, and the Faculty of Agricultural Sciences at the University of Panama to continue working as a team to improve buffalo production. These motivations should allow for growth, improvement, and amplified water buffalo for milk and meat

production in Panama. The achievements in the next ten years will depend on integrated actions from producers, government, industry, and traders; which will potentiate production and sustainability; as well as consumers since they are the main reason for livestock production anywhere around the world. Of course, it is impossible to reach a sustainable animal production model or system without economic investment and support because such resources play a major role in the sustainable livestock production system.



## Challenges and tasks for the future of a sustainable buffalo production system in Panama

The achievements of Buffalo Production in Panama demand in the first place, to define challenges and tasks that must be integrated in the present but also the future to develop a solid national program based on good livestock practices and sustainability. We must consider that a strong program for animal production requires economic support to adequate technology, industry, and commercial conditions through education, research, and extension.

There is no doubt about buffalo's capacity and its potential for milk and meat production under different ecosystems and geographical conditions. For instance, it has been recognized that buffalo presents the ability for adaptation, environmental tolerance to stress, feed efficiency, fertility, longevity, parasite resistance, milk composition and quality, meat composition, and nutritional and biological value for human consumption.

These elements are correlated to advantages regarding biology and phylogeny, which we should consider within livestock production as an alternative when the ecology does not match for dairy and beef cattle. The advantages of water buffalo represent a great option to produce milk, meat, and skin products; whose costs are lower than those compared to dairy and beef cattle. The buffalo production systems must be placed in those areas whose microecology is not recommended for dairy and beef cattle under tropical conditions. Consequently, it is appropriate to mention those challenges and tasks, which should allow us to improve the efficiency and sustainability of the buffalo production model in Panama.

The following challenges and tasks make sense and are all suggested as elements with potential impact to boost and improve the water buffalo production system in Panama:

- 1.** Establish Diploma, seminars, and other events for education on buffalo production systems.
- 2.** Include a course on Buffalo Production in agronomy and veterinary schools.
- 3.** Characterize the best national areas for buffalo production across the country.
- 4.** Define the rules and regulations for buffalo meat and milk production.
- 5.** Prepare a professional team for research and extension in buffalo.
- 6.** Develop an integrated buffalo production system based on sustainability
- 7.** Promote the buffalo products and their nutritional value for humans.
- 8.** Develop the classification and define basic prices for meat and milk buffalo products.
- 9.** Use the traceability for buffalo herds and connect the information to a national data herd.
- 10.** Computerize the national buffalo herd data.
- 11.** Establish an extension program through the government for water buffalo production.
- 12.** Relate the extension program to some research items according to the ecology in Panama.
- 13.** Define common strategies among government, producers, industry, and traders to increase buffalo production to achieve sustainability.

As we can see, many challenges and tasks have to be considered to find and reach not only production and efficiency but also sustainability of the buffalo production in Panama.

We must consider that buffalo was initiated 50 years ago in Panama; however, its history and

trends have been irregular, even when such livestock activity has been increasing during the last 50 years around the world.

Buffalo production has shown a positive trend since the world population is over 200 million and today this species is in the second place for milk production, which is 15.7% of total world dairy production (931,068 million liters in 2021) as indicated by World Dairy Records (2022) and it is expected to continue growing around the world (FAO, 2023). Finally, our mission in agriculture and livestock production should be to integrate all strategies and technologies, as well as all actors in the national agricultural scenery to ensure that buffalo production can be handled and sustained as one ruminant alternative to produce milk, meat, and other products that could be available and affordable for the Panamanian consumers to increase our animal food security at reasonable prices with a very high sustainability in Panama.

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# BUFFALOES IN BOLIVIA

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## Abstract

The water buffalo (*Bubalus bubalis*) was introduced to Bolivia in the 1960s through imports from Brazil. Currently the buffalo population is estimated at 60,000 heads. The states with the largest buffalo population are Beni, Santa Cruz de la Sierra, Pando and Cochabamba. If the current buffalo population in Bolivia were projected taking into account an annual organic growth of 13.1%, the buffalo population would grow to about 181,683 in 10 years. It should be noted that Bolivia was chosen to host the XI Buffalo Symposium of the Americas and Europe to be held in the year 2025.

**Keywords:** buffalo, population, producers, Bolivia.

## The history

According to Marco Zava, in 1964 the first 40 to 50 buffaloes from Corumbá, Brazil were brought to Bolivia and they were exemplary crosses of Mediterranean breeds

with Jafarabadi and Murrah. They were taken to the Becerra ranch, near Trinidad, capital of the Department of Beni, a low-lying area that remains flooded six months

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a year (it is the Bolivian pre-Amazon region). At first, they gave superior results to the zebuinos that were in that ranch; but later due to lack of management, the activity got out of control and the animals were slaughtered.

Buffaloes again arrived in Bolivia in 1974, thanks to a project of the European community, to support the productive development of settlers, located in the community of Paraíso in the Municipality of Puerto Villarroel, José Carrasco province, in the department of Cochabamba, through of the National Institute of Colonization (INC) (Patiño, 2016). These 200 imported buffaloes were of the Mediterranean breed, coming from Caserta, Italy, whose breeding was intended for food security (meat and milk production) and to be used in animal traction. This donation after four years of follow-up had failures, since most of the peasants gave up on the buffaloes, because their management was very different from that of cattle. Some specimens went wild.

In 1977, Mariano Justiniano, made a purchase of 70 buffaloes of the Mediterranean breed from the peasants of the Cochabamba tropics and took them to the department of Beni, as a private enterprise for raising and producing milk and cheese. He currently owns a herd of 500 buffaloes and sells 100 copies annually. Part of his herd is destined to the production and sale of milk. Later in 1978, the INC delivered 80 buffaloes and 5 males, to the Faculty of Agricultural and Livestock Sciences of the Universidad Mayor de San Simón, which raised these buffaloes for purposes of conservation, preservation, and small-scale milk and meat production, until 2013. Research work was also carried out on animal health

and animal traction.

In 1978 Robert Haab Chávez, and his sons later, began their buffalo livestock, importing from São Paulo (Brazil), as it was reported by Skorc (2021). Around the year 1986 Walter Kuljis F, acquires his first 70 buffaloes between females and males, the same ones that he imports from Rondonia - Brazil, and in this way he begins his buffalo herd in the department of Santa Cruz (Skorc, 2021).

In 1989 Miguel Magluf imported 20 female buffaloes and 3 male buffaloes from Rondonia (Brazil), of which he sold 10 females and 2 males to Mr. Arnulfo Martínez. He was left with an initial herd of 10 female and 1 male buffalo. At that time, according to Miguel Magluf, there were no buffaloes in Beni or they were not known, over time a part of Don Arnulfo Martínez's buffalo herd became indomitable and began to go to neighboring properties and even over long distances.

In this way the buffaloes arrive at Santa Rosa, Santa Ana and San Ignacio de Mojos. Most of the imports of these buffaloes belonged to the Mediterranean, Murrah and Jafarabadi breeds.

According to the National Service for Agricultural Health and Food Safety (SENASAG), the buffalo population in Bolivia in 1989 was distributed as follows. 60% in Santa Cruz de la Sierra, 39% in Beni and 1% in Cochabamba.

## The present

In 2018, the Association of Buffalo Breeders of Bolivia (ASOCRIABUF) was founded in the city of Santa Cruz de la Sierra under the presidency of Mr. Walter Kuljis



Fuchner. The aforementioned association currently has 32 buffalo producers. It should be noted that its founding partners were Walter Kuljis Fuchner, Miguel Majluf, Roberto Haap, Jose Nogales, Denis Gomez, Rodrigo Molina, Luis Quiles Skorc and Efraín Chacón.

According to data from the Federation of Cattlemen of Santa Cruz (FEGASACRUZ) the buffalo population in Bolivia is currently 60,000 heads. (FEGASACRUZ, 2023) If we take as reference the official buffalo population according to FEGASACRUZ of 60,000 heads for the year 2022 and we consider the figure of 13.1% annual population growth of buffaloes in Argentina for 10 years (Crudeli, 2011) and extrapolate it to Bolivia, a buffalo population of 181,683 heads would be reached in this country in the year 2032.

The producers of Beni and Santa Cruz allocate their production to the sale of meat and milk at the local and departmental level and privately in supermarkets as an initiative of private entrepreneurs.

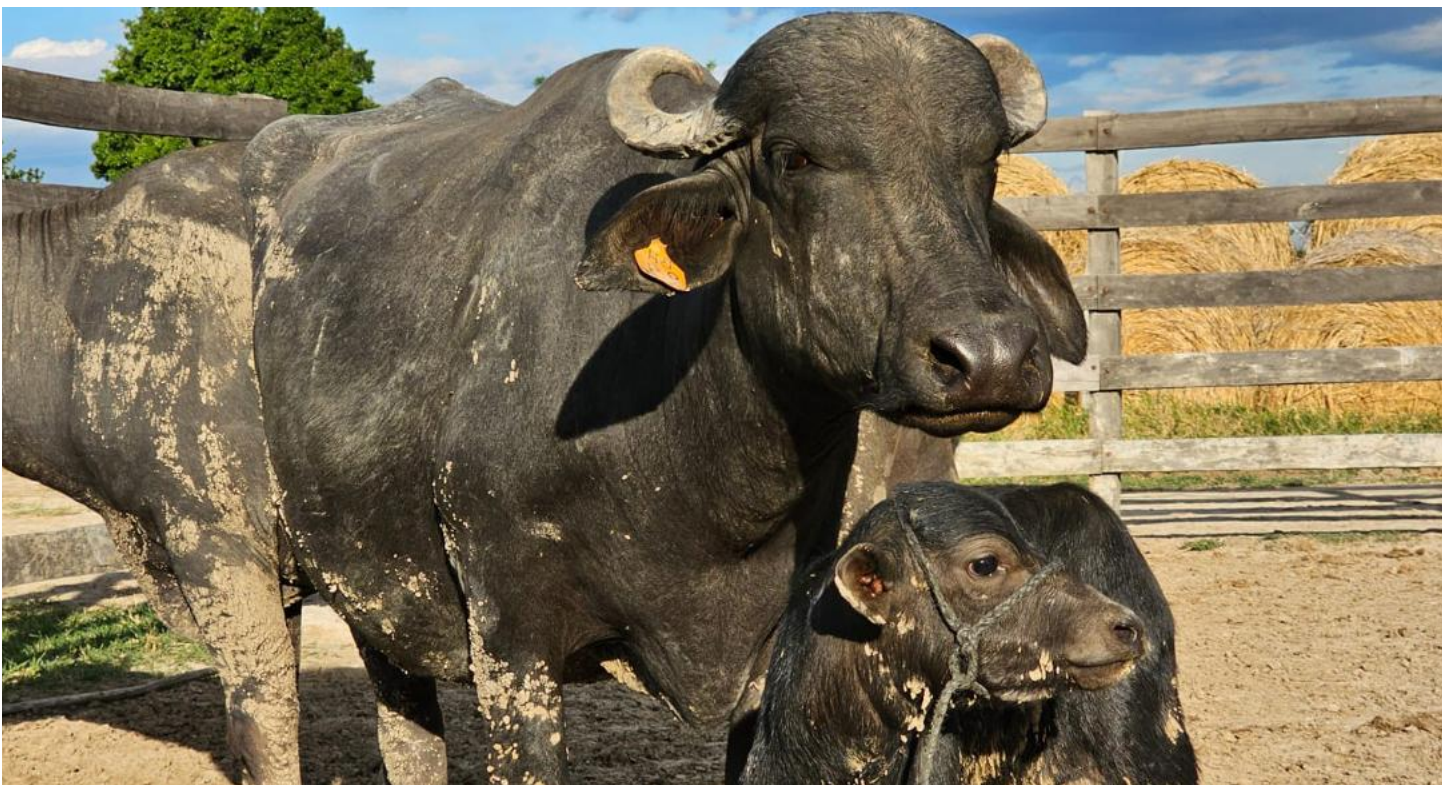
Among dairy derivatives, it should be mentioned that mozzarella cheese is only marketed on a small scale, since it is not yet a product of interest to consumers

who prefer cheese made from cow's milk, for which development is very important marketing for the promotion of buffalo products.

## The future

The possible improvements to the buffalo production systems go beyond the technical-productive aspects, since the market conditions must also be considered so that the corresponding sanitary and safety standards are integrated, in order to differentiate milk, meat and derivatives from the buffalo, highlighting its qualities. These actions could be accompanied by dissemination campaigns so that consumers are aware of the peculiarities of the products and by-products of this species. To promote its acceptance, it is necessary for the academic sector to broaden and deepen its research on the breeding, management and use of the buffalo.

Both basic and experimental information on the productive potential of the species is required, as well as the development of technologies to increase the productivity of farms, under a sustainable development perspective. In addition, more efficient organization and market access schemes are needed to generate



higher income for producers and promote regional development in tropical areas that allow it. It is very important to note that Bolivia was chosen to host the XI Buffalo Symposium of the Americas and Europe in the year 2025.

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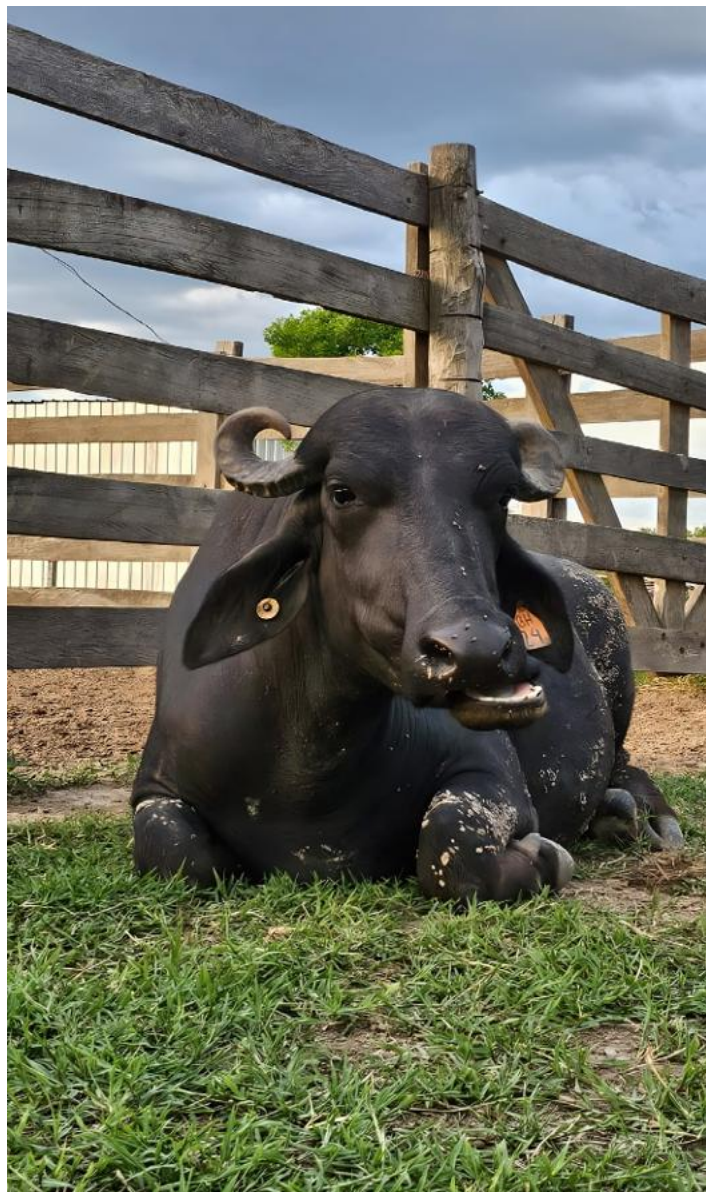
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# PROCEEDINGS OF THE 13<sup>TH</sup> WORLD BUFFALO CONGRESS IN VENEZUELA

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The Proceedings of the 13<sup>th</sup> WBC have been published in Revista Científica Facultad de Ciencias Veterinaria of University of Zulia (FCV-LUZ Vol. XXXIII, Supl. Esp., 25, 2023).

The Congress aimed to highlight the importance of buffalo farming committed to achieving a neutral carbon footprint of livestock for a sustainable world. It was possible to deepen and discuss different areas through 22 invited lectures from International recognized scientists and over 100 oral and poster communications in the session listed below.

Listed, you have the invited lecture presented in the various sessions of the congress on Buffalo Management and Animal Welfare; Feed and Nutrition; Animal One Health; Breeding and genetics, Reproduction and Biotechnology, Buffalo's products, industry and marketing, Sustainability and Socioeconomics

## 1 MANAGEMENT, BEHAVIOR & ANIMAL WELFARE

### ■ Sustainability of buffalo farming in different environments in the world

Antonio Borghese, Vittoria L. Barile, Antonella Chiariotti (Italy)

### ■ Maximizing the potential of water buffalo milkability: best practices and lessons learned

Carlo Boselli, Antonio Borghese (Italy)

## 2 FEED AND NUTRITION

### ■ Nutritional strategies for maximizing buffalo production efficiency

Amrish Kumar Tyagi, Sachin Kumar, Sravani Balaga, K. Barman (India)

### ■ Buffalo feed efficiency: optimizing the use of fibrous biomass carbon to enhance production while mitigating rumen methane emission

Metha Wanapat (Thailand)

## 3 GENETICS & ANIMAL BREEDING

### ■ Our experience of buffalo improvement in India: last 50 years journey.

Tirtha Kumar Datta (India)

### ■ Genetic, hereditary and congenital diseases in buffaloes: are they a limiting factor for the buffalo development in Latin America?

William Gomes Vale, Maria Cecília Florisbal Damé (Brasil)

## 4 ANIMAL HEALTH & ONE HEALTH

### ■ Expansion of the buffalo agri-system and industry following the One Health approach

Gabriela M. Carruyo, Ericka Calderon, Armando E. Hoet (Venezuela).

### ■ Building resilient cattle through better management of buffalo health

Alfredo Sánchez, Merilio Montero (Venezuela)

## 5 REPRODUCTION

- **Pregnancy-associated glycoproteins in buffalo: origins, functions and clinical application for pregnancy follow-up**

Olimpia Barbato, Vittoria L. Barile (Italy)

- **Breeding for sustainability: how reproductive biotechnologies can help buffalo farmers combat climate change**

Pietro Sampaio Baruselli, Laís Ângelo de Abreu, Vanessa Romário de Paula, Sofía Albertini, Guilherme Felipe Ferreira dos Santos, Lígia Mattos Rebeis, Emanuelle Almeida Gricio, Nelcio A.T. de Carvalho, Otavio Bernardes (Brasil)

- **Integrated technique of buffalo fertility management in Nepal**

Bhuminand Devkota, Shatrughan Shah, Gokarna Gautam (Nepal)

## 6 BIOTECHNOLOGY & OMICS TECHNOLOGIES

- **Implementing genomic selection in the IMB: challenges and opportunities**

Stefano Biffani, Mayra Gómez, Roberta Cimmino, Dario Rossi, Gianluigi Zullo, Riccardo Negrini, Alberto Cesarani, Giuseppe Campanile, Gianluca Neglia (Italy)

- **Animal cloning and genome editing in buffalo, with special reference to India**

Naresh Selokar, Manoj Kumar Singh (India)

- **From DNA to sustainability: the genomics approach in livestock production**

Juan Carlos Gutiérrez-Añez (Venezuela)

## 7 BUFFALO'S PRODUCTS & INDUSTRY

- **Buffalo meat quality, processing, and marketing: harnessing its benefits and nutraceutical potential**

Sebastiana Failla (Italy)

- **Exploring the buffalo whey: a look at nanotechnology in search of strategies for the modern nutraceutical industry**

Franco E. Vasile (Argentina)

## 8 SUSTAINABILITY & SOCIOECONOMICS

- **Precision livestock farming in buffalo species: a sustainable approach for the future**

Gianluca Neglia, Roberta Matera, Alessio Cotticelli, Angela Salzano, Roberta Cimmino, Giuseppe Campanile (Italy)

- **Precision livestock under the tropical perspective: straightforward steps to face climatic change**

Andres F. Perez Rojo (Colombia)

- **Sustainability and livestock: a doable combination**

Antonella Chiariotti (Italy)

The proceedings of the 13<sup>th</sup> WBC can be download at the following link

[\(Vol. 33 Núm. Suplemento \(2023\): Libro de Actas del 13.º Congreso Mundial de Búfalos 2023 | Revista Científica de la Facultad de Ciencias Veterinarias de la Universidad del Zulia \(produccioncientificaluz.org\)\)](#)

# PRE-CONGRESS WORKSHOPS

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During the 13<sup>th</sup> World Buffalo Congress in Venezuela 2023, several practical workshops were offered to allow the participants to learn side by side with the instructors and through their hands how to transform buffalo's values into high-quality and nutritious products, as

well as witness the application of modern reproductive biotechnologies and understand the approaches to warrant animal welfare and the tools for sustainable livestock farming.

## REPRODUCTION AND ASSISTED REPRODUCTIVE TECHNOLOGIES IN BUFFALOES WORKSHOP

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Juan Carlos Gutiérrez-Añez<sup>1</sup>

The workshop on Reproduction and Assisted Reproductive Technologies in Buffaloes, which I had the honor to organize and coordinate, brought academicians and scientists from all continents, allowing the participants to gather an international approach and learn and discuss the basis of buffalo reproduction but also to evidence the potential of modern biotechnologies that can be applied in this species.

During two days (November 20-21, 2023), theoretical themes taught to 42 enthusiastic participants from different countries included buffalo's gynecology, andrology, infertility management, Artificial Insemination (AI), estrus/ovulation synchronization and fixed time artificial insemination (TAI), reproductive ultrasonography, Embryo Transfer (ET), in vitro embryo production, reproductive cloning, and genome editing, while practical demonstrations on breeding soundness ex-

amination in buffalo male, pregnancy diagnosis, fetal sexing through ultrasound, Ovum Pick up (OPU), and oocytes evaluation were performed.



<sup>1</sup> College of Veterinary Medicine, University of Zulia, Venezuela  
The pictures included in this article belong to the author



The program delivered by internationally recognized academicians included themes such as:

- Reproductive buffalo male anatomy and physiology (Dr. José Luis Konrad, Argentina)
- Breeding Soundness Examination (BSE) in Buffalo Male and Semen Processing in Buffalo Bulls (Dr. William Vale, Brazil)
- Reproductive Physiology in Female Buffaloes, Fixed Time Artificial Insemination (TAI) and Embryo Technologies in Buffaloes (Dr. Pietro Baruselli, Brazil)
- Impact of Fixed-Time Artificial Insemination (TAI) Application on Genetic Improvement of Dairy Buffaloes in the Tropics (Dr. Juan Carlos Gutiérrez, Venezuela)
- Critical aspects to consider when conducting Ovum pick up (OPU) under field conditions (Dr. Antonio González, Germany)
- Strategies to advance puberty in buffalo heifers (Dr. Vittoria L. Barile, Italy)
- Strategies to maintain pregnancy after insemination in buffalo (Dr. Olimpia Barbato, Italy)
- Advanced Biotechnologies (Reproductive Cloning and Genome Editing) in Buffaloes (Dr. Naresh Selokar, India)

Interestingly, the practical demonstration that includes the examination of buffalo males, ultrasonography, and OPU session were performed in Congress site, the

Hotel Meliá, a five-star hotel located in the capital city of Venezuela, Caracas. To our knowledge, this could be the first time in a World Buffalo Congress where a practical demonstration is done in the hotel venue facilities. We encountered an enthusiastic, active, dynamic, and interested cohort of participants that enriched the discussion and pleasantly impressed the panel of instructors.

The possibility of following up the practical sessions after finishing the theoretical lectures allowed the participants to evidence the aspects the instructors taught during their lessons and enrich the Q&A rounds. In addition, breeders and livestock workers participated in the practical rounds and heard all the knowledge and advice the instructors were teaching. The experience lived in Caracas during the 13<sup>th</sup> World Buffalo Congress, 2023, in all activities involved in such a great event, will last forever in the minds and hearts of all the attending participants, including myself, who had the honor and privilege among many others of contributing to its organization.



# BUFFALO MEAT PRODUCTS & INDUSTRY WORKSHOP

Gladis Rebak<sup>1</sup>

Within the framework of the 13<sup>th</sup> World Buffalo Congress held in Venezuela, the Workshop on Buffalo Meat Products & Industry was carried out on November 20 and 21, 2023, in the facilities of the Gran Meliá Hotel.

This Workshop was taught by doctors Gladis Isabel Rébak and Diego Gómez from the Faculty of Veterinary Sciences of the National University of the Northeast of Argentina and Prof. Dr. Enrique Márquez from the University of Zulia and the Foodtech company from Venezuela.

Sixteenth professional and technical participants from the public and private sectors, producers, teachers, packers, and entrepreneurs, some with prior knowledge and others venturing into the activity to incorporate added value to buffalo meat, participated in this Workshop.

The Workshop's opening was attended by the President of the International Buffalo Federation, Nicola Fabbozzo, the President of the 13<sup>th</sup> World Buffalo Congress Scientific Committee, Prof. Dr. Juan Carlos Gutiérrez, and the President of the Venezuelan Meat Council (CONVECAR), Luis Pérez Stuve.

The modality of the dictation was theoretical and practical, with presentations of the instructions by the speakers in one of the assigned rooms, delivering written material with the development of the topics. Then, in the hotel kitchens, they proceeded to prepare different products.

## The general objective of the Workshop was:

Generate process methodologies for by-products derived

<sup>1</sup> University of The Northeast, Argentina  
The pictures included in this article belong to the author

from buffalo meat: sausages and non-sausages: fresh, dry, and cooked, applying production, packaging, and labeling technologies aimed at offering hygienic-sanitary, industrial, and nutritional quality to incorporate added value to the buffalo meat.

## The specific objectives were:

Propose, evaluate, and analyze the preparation of fresh, dry, and cooked sausages with buffalo meat through:

- The study of available raw materials.
- Choice of appropriate containers (guts).
- Evaluation of available packaging technology.
- Incorporation of conservation systems to preserve products and improve their flavor.

Application of Good Manufacturing Practices (GMP) in the production of sausages.





## The topics developed in the theoretical sections during the two days were:

- Slaughter flow chart and critical points during Buffalo meat industry processing.
- Critical aspects for obtaining suitable retail and commercial cuts for meat products and by-products.
- Buffalo meat quality attributes that influence the final product: processing temperature, color, water retention capacity, pH, and others.
- Choice of raw materials, containers, and additives to produce buffalo meat products. Uses of starters. Raw material quality control.
- Conservation methods (physical, chemical, and biological) and packaging systems (vacuum, modified atmosphere) used in marketing buffalo meat products.
- Quality control of finished products (organoleptic and microbiological tests).
- Sausage Factory: Construction and authorization requirements.

In the practical activities with the active participation of the attendees, Hamburgers, Meat Medallions, Chorizo (fresh sausage), Salamín (dry sausage), and Butifarra (cooked sausage) were prepared.

To achieve Workshop goals, demonstrations were conducted on cutting meat and bacon and weighing them depending on the established formula (with and without preservatives) according to the meat products and by-products to be produced. The raw material was ground or chopped, achieving the ideal granulation of the dough, depending on the product. They were mixed, adding healing substances, spices, and seasonings with manual and mechanical kneading. Each

participant weighed, shaped, and conditioned the hamburgers and meat medallions and proceeded to stuff the sausages into natural and artificial containers (casings) and tie or bind the fresh and cooked products (sausages). The lecturers showed the ripened Argentine products (salamis) to highlight the importance of this conservation method.

At the end of both training days, the products elaborated on by the participants and guests at the event were tested during the welcoming cocktail.

The great interest shown by the participants, the inter-institutional and international links, and the atmosphere of camaraderie and collaboration added to the excellent predisposition of the organization and managers of the hotel where the Workshop was held and stood out.



# BUFFALO INDUSTRY AND DAIRY PRODUCTS WORKSHOP

Franco Vasile<sup>1</sup>

The meeting, held in Caracas, Venezuela in November 2023, allowed producers, entrepreneurs, artisans, and academics to participate in a workshop on the production of dairy products of bubaline origin, led by expert speakers.

The workshop was conducted by Dr. Angelo Citro, a famous Italian veterinarian dedicated to cheese making, Dr. Franco Vasile, an Argentine University professor and researcher, who has advanced in the design of unconventional products from milk and cheese whey, and Mg. Emiro Valbuena, who works as a professor at the host university of the event.

The workshop was organized over two days with a strong emphasis on practical aspects. The day before, trials began to obtain the fermented whey that would

be used in the following days. During the first day, the fundamental techniques for quality control were tested, and skills were acquired in controlling parameters, times, and processes. We worked with approximately 300 liters of milk from the “FELMAR CA” farm, in the State of Cojedes (Venezuela).

The students from Venezuela, Colombia, Mexico, and Paraguay expressed great enthusiasm and commitment to the development of the activities.

They were organized into five groups and each one worked with approximately 25 kg of raw milk. In the time it took for acidification and coagulation, theoretical classes were given. The physicochemical, microbiological, and sensory aspects were covered.

Dr. Citro delved into the essential aspects of the tech-



<sup>1</sup> Instituto de Investigaciones en Procesos Tecnológicos Avanzados (INIPTA, CONICET - UNCAUS). P. R. S. Peña, Chaco - Argentina  
The pictures included in this article belong to the author



nology for making different types of cheese, anecdotally addressing the history of his family dedicated to this activity.

Dr. Valbuena provided the physicochemical bases and foundations, while the Dr. Franco Vasile introduced the students to basic notions of products other than cheese. During the workshop, Dr. Vasile taught how to make dairy desserts based on buffalo milk. This sweet preparation, made from milk thickened with corn starch in its vanilla and chocolate versions, attracted the attention of attendees for its simplicity, speed and great sensory appeal.

The workshop time was enough to learn how to make mozzarella, burrata, manta and scamorza among other varieties that were finally tasted by those attending this and other courses at the congress. The students also expressed interest to address other technologies such as the preparation of “dulce de leche”, ice cream and other types of cheese in future meetings. Having demonstrated the benefits of buffalo milk in its transformation, this course ended with the express satisfaction of its participants, teachers, and organizers, echoing the gratitude to the president of the International Buffalo Federation, the organizers of the congress, the president of the Committee Scientist, those responsible for logistics and hotel staff, among others.



# ANIMAL WELFARE WORKSHOP

Domenico Vecchio<sup>1</sup>

On November 21<sup>st</sup> the pre-congress courses on Animal Welfare took place at the conference headquarters of the 13<sup>th</sup> World Buffalo Congress held in Caracas.

The following participated as speakers in the course: Dr. Luiz Alberto De La Cruz Cruz (Metropolitan Autonomous University Mexico City), Dr. Juan Guillermo Villa (Centrauro Animal and Human Welfare, Venezuela), and Dr. Domenico Vecchio (Istituto Zooprofilattico Sperimentale del Mezzogiorno- Italian National Reference Centre on Water Buffalo Farming and Productions Hygiene and Technologies).

The topics covered allowed the learners to receive information on the importance of Animal welfare in livestock production and to delve into animal welfare concepts

linked to the buffalo species through an approach that was able to combine the evolution of knowledge on the topic over the last 20 years.

Attention was directed by emphasizing the importance of management and structural aspects in response to the ethological and productive needs of the species, as well as on the management strategies that can be implemented to improve human-animal interaction in production systems.

The comparison between different production systems has allowed us to highlight the multiple types of critical issues that animals and farmers may have to face.

Also important was the information on aspects of an-



<sup>1</sup> National Reference Centre on Water Buffalo Farming and Productions Hygiene and Technologies. Portici (Napoli) Italy.  
The pictures included in this article belong to the author



imal welfare linked to other phases of the buffalo's life such as transport and slaughter.

The technical part concluded with a presentation of the animal welfare evaluation systems applied to the buffalo species with an in-depth analysis of the system applied in Italy based on risk analysis and animal welfare certification systems.

The day ended with a panel discussion entitled "The importance of Animal Welfare in current society: farmers, citizens and consumers perception" in which the speakers included Prof Adroaldo Zanella of the University of Sao Paulo, Prof. George Stilwell of the University of Lisbon and prof. Natalia Barbosa of the Federal Rural University of Amazonia.

For the first time in the history of this event, the 13<sup>th</sup> World Buffalo congress saw an entire course dedicated to the topic of animal welfare applied to the buffalo species.

There are many suggestions for reflection and active participation of the students, proof of the foresight of the organizing committee.

It is certain that in the next meetings it will be possible to expand the exchange of scientific information and

applied research on these issues, enhancing an aspect that can become a strong point of the buffalo system.



# 13<sup>TH</sup> WORLD BUFFALO CONGRESS

Hotel Melia, CARACAS, Venezuela,  
November 22-24, 2023

Antonio Borghese<sup>1</sup>

The 13<sup>th</sup> World Buffalo Congress (WBC) was organized by University of Zulia (Maracaibo), International Buffalo Federation (IBF), American Federation of Buffalo Breeders, Venezuela Association Buffalo Breeders (CRIABUFALOS) with the title “For a neutral Carbon footprint Livestock”. Over 150 abstract proposals for poster and short oral presentations worldwide were received.

Moreover, twenty-two lectures by internationally recognized scientists paved the way for an enriched discussion and nutritious feedback. The information released in the Congress is compiled a volume of the international scientific journal of the College of Veterinary Medicine

of the University of Zulia, Venezuela. The WBC started on November 22, 2023, in the splendid Hotel Melia congress room, in Caracas, with an official open meeting and welcome greetings by the IBF President Nicola Fabbozzo.

The IBF General Secretary, Prof. Antonio Borghese, presented a short history of the activities of the IBF, founded in 1985 in Cairo, including congresses every year, training courses every two years, projects, information by social and by Buffalo Newsletter, and finally he remembered the VI World Buffalo Congress in Venezuela at Maracaibo and the involved Venezuelan people at



<sup>1</sup>General Secretary of International Buffalo Federation



that time: Pablo Moser, Hector Scanone, Jesus Reggeti, dear friends in our memory.

The first conference in plenary Session, Session 1 on Buffalo management, was presented by Prof. Antonio Borghese, with the title **Sustainability of Buffalo Farming in Different Environments in the World**, introducing the general topic of the Congress. The author showed the buffalo population increasing in the world and the different systems of management, according to the climatic and environmental situation in the countries where the extensive system is applicable for the availability of large areas of pastures, respecting the ecosystem. Buffalo farming in the marshlands, where buffalo can thrive in a difficult environment and produce milk and meat where other ruminants cannot survive, preserving a unique habitat. Family farming is very widespread in Asia, particularly on rice fields, where buffalo is used as a draft animal, producing more milk, meat, manure, horns and bone for the family. Last but not least the intensive systems where advanced technologies are developed to increase sustainability and welfare.

The second conference was presented by Dr Carlo Boselli from Rome Animal Prophylaxis Research Institute on **Maximizing the potential of Water Buffalo Milkability: best practices and lessons learned**, where 8 different types of milk flow curves were identified, to optimize milking practices, reducing labour time and increase milk ejection.

After the discussion the plenary Session 2 on Feed and Nutrition, was opened with the lecture by Prof. Amrish



Kumar Tyagi from ICAR (Indian Council Agricultural Research) on **Nutritional strategies for maximizing buffalo production efficiency**, followed by Prof. Metha Wanapat from Khon Kaen University, Thailand, on **Buffalo feed efficiency: optimizing the use of fibrous biomass carbon to enhance production while mitigating rumen methane emission**. This is a very actual topic because the ruminant livestock is accused by animalist and vegetarian parties of being highly responsible for climatic change due to rumen methane emission when they contribute 5.8% of total, mainly from intensive systems. The author showed that some integrations as U-lime treated rice straw and supplementation of phytonutrient fruit-peel pellets (MARABAC) have significantly improved rumen fermentation, influencing microbiota and reducing methanogenesis, increasing milk yield too.

After lunch inside the hotel, the plenary Session on Genetics and Animal breeding (Session 3) was held with presentations by Dr T.K. Datta from ICAR, on **The experience of buffalo improvement in India in the last 50 years**; followed by Prof. Nestor Montiel Urdaneta



lined the problem of antibiotic resistance which could be in the future the first cause of death in the human. After the discussion, the welcome cocktail inside the hotel was offered.

The second day, November 23, many lectures were presented in plenary Session, starting with Session 5 on Reproduction: Prof. Olimpia Barbato from Perugia University spoke on **Pregnancy-Associated Glycoproteins in buffalo**, showing that in buffalo PAGs increase rapidly after 23 days of pregnancy and decrease after calving, so they can be used both for pregnancy diagnosis starting at 25 days and for embryonic mortality diagnosis. Prof. Bhuminand Devkota from Agricultural and Forestry University, Nepal, spoke on **Integrated technique on buffalo fertility management in Nepal**, as buffalo in Nepal contributes 57% of total milk and 36% of total meat. He showed different synchronization protocols (Ovsinch, CIDR) to increase fertility in Parkote and Lime breeds applying TAI (Timed Artificial Insemination) as acyclicity with inactive ovaries is the major problem during the low breeding season. He highlighted that the anthelmintic treatment and nutritional supplementa-

from University of Zulia, on **History and evolution of buffalo in Venezuela**, particularly for milk production. In 1920 the first buffaloes were imported, in 2000 a massive import from Brazil and Colombia of Murrah and Mediterranean Italian buffaloes, particularly by the most important breeders as Pablo Moser, Hector Scanone, Jesus Reggeti, allowed to obtain 2566 kg milk in 261 days of lactation and 510 kg live weight in 26 months on castrated buffaloes. Finally Prof. William Vale from Ceara University, Brazil, spoke on **Genetic, hereditary and congenital diseases in buffaloes: are they a limiting factor for the buffalo development in Latin America?** The author showed the disabilities, complete or partial, characterized by abnormalities in the structure and function of tracts or organs, improving a development control strategy through the reduction of inbreeding and the use of breeding animals proven to be free of these undesirable genes, in order to control and eliminate such kind of diseases.

Session 4 on Animal Health presented invited lectures by Prof. Alfredo Sanchez with **Building resilient cattle through better management of buffalo health** and Prof. Gabriela Carruyo with **Expansion of the buffalo agri-system and industry following the One Health approach**, both from University of Zulia and by Dr Domenico Vecchio from Animal Prophylaxis Research Institute of Southern Italy on **Animal welfare correlation with biosecurity and antimicrobial use in buffalo farm evaluated by classy farm system**. The author under-





tion, before synchronization improved the conception rate. Prof. Pietro Baruselli from University of Sao Paulo, spoke on **Breeding for sustainability: how reproductive biotechnologies can help buffalo farmers combat climate changes**. He showed OPU (Ovum Pick Up), ET (Embryo Transfer) and IVEP (In Vitro Embryo Production) techniques with the goals of reducing the age at first calving and selecting buffaloes to produce more milk and less methane.

In Session 6 on Biotechnology and Omics, Dr Mayra Gomez Carpio from ANASB (National Association of Buffalo Breeders, Italy) presented the lecture on **Implementing Genomic Selection in the Italian Mediterranean Buffaloes: challenges and opportunities**. The author showed the first results of implementing genomic evaluation for production and type traits in Italian Mediterranean Buffalo. Phenotypic information in production (270 days milk, mozzarella yield, protein and fat kg and %) and morphology (feet and legs and mammary system) were used on 743,904 lactations from 276,451 buffalo cows. Dr Naresh Selokar from ICAR, India, spoke on **Reproductive cloning and genome editing in buffalo: a way forward for improved productivity**.

Prof. Juan Carlos Gutierrez from the University of Zulia spoke on **DNA to sustainability: the genomics approach in livestock production**.

Session 7 on Buffalo's products and Industry, started with the lecture of Dr Sebastiana Failla by CREA (Council for Agricultural Research and Economics, Italy) on





**Buffalo meat quality, processing and marketing: harnessing its benefits and nutraceutical potential.**

Dr Failla underlined nutraceutical properties of buffalo meat: the abundance of trans vaccenic and conjugated linoleic acid (CLA) with anticarcinogenic properties, of polyunsaturated n3 fatty acids, vital for human health as precursors of anti-inflammatory prostaglandins, of N-acetylneuraminic sialic acid (Neu5ac) an essential nutrient for brain development and function.

Followed the lecture of Dr Franco Vasile by UNCAUS (Chaco Austral University), Argentina, on **Exploring the buffalo whey: a look on nanotechnology** in search of strategies for the modern nutraceutical industry, where the author explained the different utilizations of buffalo whey, not only for ricotta production but also as an ingredient for nutritional supplement beverages and food additives. Particularly, he presented some novel uses of bubaline whey proteins, particularly as raw material in synthesizing functional nanostructures and as nanocarriers of physiologically active compounds.

In Session 8 on Sustainability and socioeconomics Prof. Gianluca Neglia from Federico II University of Naples, presented a lecture on **Precision livestock farming**

**in buffalo species: a sustainable approach for the future**, defining Precision Livestock farming as the continuous, automated, and real-time monitoring of production, reproduction, health and welfare through the application of advanced information and communication technologies.

The Ing. Andres F. Perez Rojo from ASOBUFALOS, Colombia, spoke on **Precision livestock under the tropical perspective: straightforward steps to face climatic change**. Dr Antonella Chiariotti from CREA, Italy, presented a lecture on **Sustainability and livestock: a doable combination**, with several goals: reducing food waste, which accounts for 1.3 billion tons per year, implementing livestock farming, promoting sustainable food demand from a growing population, more than 9 billion people on 2050, reducing methane production, investigating various mitigation strategies.

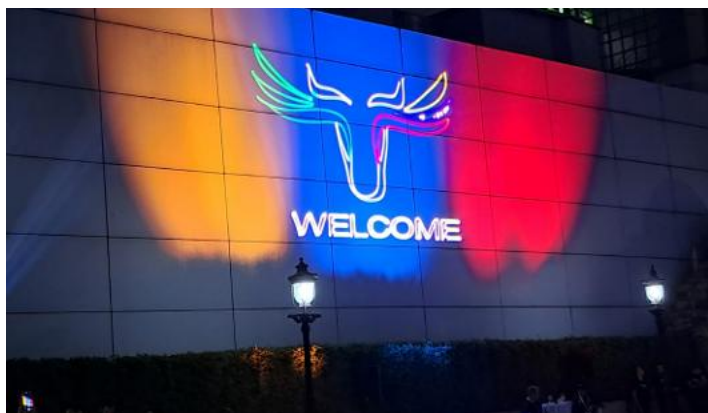
The day ended with a convivial gala dinner in white dress code and music.

The third day, was dedicated to short oral communications: The first with scientists and academicians, the



second with breeders and associations, and the third with professionals and entrepreneurs. In parallel with the Congress, a livestock exhibition was set up outside the Hotel Meliá, with the judging of the animals and the awarding of prizes to the champions. The winning Buffalo bull (from the Pluchino stud farm) made its lap of honour in the great hall of the Congress during the closing ceremony.

The closing ceremony was held with many awarding of prizes to organizers and people who had a particular role in the WBC, as Joao Ghaspar De Almeida, Brazil, for



his presidency of the American Buffalo Breeders Federation, all the Presidents of American Buffalo Breeders Associations: Claudia Roldan for Colombia, Luis Scor for Bolivia, Ismael Coronel for Mexico, Otavio Bernardes for Brazil, Richard Moss for Paraguay, Angelo Pluchino for his activity on Murrah breed.

Dr Vittoria L. Barile was awarded for the best oral presentation, Dr Mayra Gómez Carpio for the best poster, Dr Pablo Alexandro for the student competition, Hector Scannone at the memory, Nicola Fabbozzo for the good organization of the 13<sup>th</sup> World Buffalo Congress, all the women were awarded too for their participation. Prof. Borghese received a plate and a big buffalo figure, and he gave copies of his famous books on buffalo livestock to the President of the Scientific Committee Prof. Juan Carlos Gutierrez-Anez and the IBF President Nicola Fabbozzo.

Prof. Campanile showed the video about the organization of the 14<sup>th</sup> World Buffalo Congress to be held in Naples in 2026.

A farewell concert closed the conference.







# INTERNATIONAL BUFFALO FEDERATION

## INTERNATIONAL BUFFALO FEDERATION GENERAL ASSEMBLY

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During the Congress, on November 24<sup>th</sup> the IBF Assembly was held seeing the participation of many IBF members.

The IBF President Nicola Fabbozzo welcomed the participants and underlined the success of the World Buffalo Congress, in Venezuela.

The General Secretary Prof. Antonio Borghese illustrated the history of the IBF since 1985, the aims, and the different activities developed during the years such as support to international congresses, technical courses, webinars, newsletters and so on.

In 2023 the IBF reached 174 associates in 36 countries of the 5 continents.

Prof Borghese also thanked Dr Antonella Chiariotti and Vittoria L. Barile, for their support in the General

Secretariat Office hosted in Monterotondo in the CREA Research Center Animal Production and Aquaculture. He presented the candidatures proposed for the next World Buffalo Congress in 2026 from the representatives of Greece, Italy and Pakistan.

Since Greece and Pakistan were not present Prof. Borghese declared that the candidature was no longer valid. Numerous associates as Prof Wanapat from Thailand, Joao Ghaspar de Almeida and Prof Vale from Brazil, Naresh Selokar from India, Prof Bhumind Devkota from Nepal, Luis Pacheco Diaz from Venezuela, and Juan Angel from Colombia agreed about and supported the Italian candidature.

Prof. Giuseppe Campanile was invited to present the candidature of Federico II University in Naples, Italy. He

showed a video about the University organization and activities, about Naples's beauties, art, and history, and a provisional 14<sup>th</sup> WBC program.

The assembly voted at unanimity for Italy to host the next WBC in 2026 and Prof. Campanile as IBF President for the period 2024- 2026.

A warm wish to the new President and Italy for the Next WBC in 2026.





# BUFFALO TOUR

Antonella Chiariotti and Vittoria L. Barile<sup>1</sup>

After the 13<sup>th</sup> World Buffalo Congress held in Caracas, the congress committee organized the Buffalo tour. A wonderful chance for participants to see some representative buffalo farms in the country. The first leg of the tour began in the state of Guárico, which takes its name from the river that runs through, and whose capital, Calabozo, is considered the granary of the country.

A few kilometers from Calabozo in San Fernando de Apure there is a giant installation dedicated to buffalo “**El Búfalo de Camaguan**”. The Amaro family built it to honor the memory of the father Ing Domingo Amaro Rangel. The family owns the company Agropecuaria La Union, in Hato Santa Rosa, the property covers 12000 hectares and breeds over 6000 water buffaloes and applies the circular economy model of production and consumption in its operations.



<sup>1</sup> Council for Agricultural Research and Economics, CREA Research Centre for Animal Production and Aquaculture, Monterotondo, Italy

**Agropecuaria La Unión** is located in a wildlife reserve called Esteros de Camaguán, a protected natural area. During the visit, it was possible to admire the natural landscape of Venezuelan Savana flooded in winter, full of nature and color, and capture the flights of numerous beautiful birds. The place is characterized as being one of the largest water reserves in the country.



In the farm was also possible to watch a **Coleo show**. This is a traditional Venezuelan and Colombian sport, very similar to a rodeo, where a small group of llaneros (cowboys) on horseback pursue cattle (or buffalo) at high speeds through a narrow pathway to drop or tumble them. It is very popular in Venezuela and parts of Colombia, mostly in the plains as a side attraction during large events.

Participants had the opportunity to attend the buffalo auction at the **Asobufalo Fair** in San Fernando de Apure.



Another large estate visited was the farm **La Guanota** owned by the Moser family who introduced dairy buffaloes in Venezuela in 1974. We were received by Mrs Susanna Scannone Moser, the widow of Hector Scannone and daughter of Pablo Moser, both famous breeders of Venezuela. Its Guanota curious name comes from a hard-working bee that produces very tasty honey. The farm extends on 9000 hectares and owns 3000 buffaloes. Agropecuaria La Guanota is well known for its long history in the breeding of dairy buffaloes of high genetic quality. In the 70's, 80's, and 90's the best dairy buffalo herds from Bulgaria and Italy were brought to Venezuela and specifically to La Guanota.





These herds have also been supplemented with semen from the best-breeding bulls from Brazil, Italy, Bulgaria, and India. This has allowed to formation of a genetic base with a very high dairy potential.

The family owns the **Bufito factory** and a new plant (inaugurated during the visit) to process up to 9,000 liters of milk per day and produce mozzarella, bocconcini, and other milk products. They are famous for the '**Dulce de Leche de Búfala**' called Bufito, a traditional preparation in all Latin American countries based on cow milk, sugar, and flavors which they first made with buffalo milk.





On the last day, the group visited the farm **La Soledad** owned by Mr. Angelo Pluchino in the State of Cojedes, to see his high-genealogy buffaloes, including the national champion. He started the buffalo breeding 35 years ago with 40 animals coming from La Guanota Farm. Nowadays he has pure breed lines both of Murrah and Mediterranean and won numerous prizes. On the farm, they use a milking system in the presence of calves to facilitate milk ejection and eliminate the use of oxytocin. The milk of La Soledad is processed in the Bufilat factory.





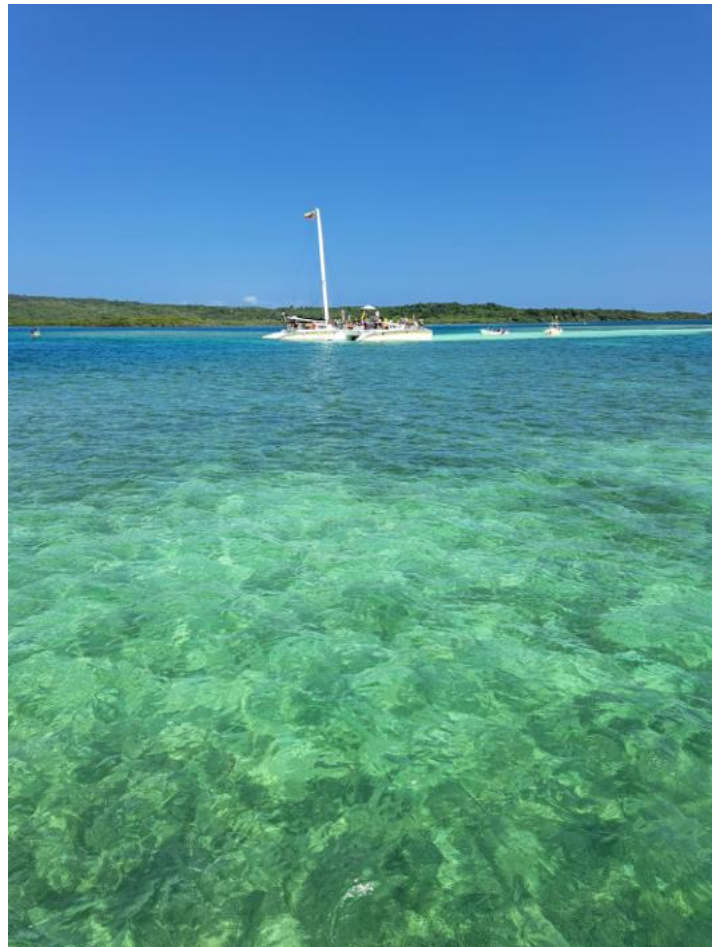
The last visit was to Finca **El Pilar**, owned by Mr. José Antonio Molina Rodríguez in the state of Cojedes. He owns 3850 hectares and started rearing buffalo in 1995 together with cows and since 2009 concentrated only on buffalo of the Murrah breed. In 2015, the milk processing plant produced fresh mozzarellas and matured cheeses such as Manchego and Pecorino. In 2022 work as a bull center selling semen of high genetics of Murrah breed. (A short video about the visit can be seen here [https://www.instagram.com/lacteos\\_el\\_pilar/reel/COO5KxPuomn/](https://www.instagram.com/lacteos_el_pilar/reel/COO5KxPuomn/).)





The tour ended with a catamaran trip to visit **Morrocóy National Park**, a protected island and marine reserve on the Caribbean coast of Venezuela. Part of Falcón state, it's known for its mangroves, island beaches, and cays. The park's clear waters feature coral reefs teeming with fish, sea turtles, and birdlife.

During the buffalo tour, the group was beautifully welcomed everywhere with music and traditional dishes, so being able to appreciate the friendly and warm hospitality of the Venezuelan people.



## UPCOMING EVENTS

# FIRST INTERNATIONAL CONFERENCE ON BUFFALO MOZZARELLA AND MILK PRODUCTS

Naples, Italy, 2024

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**Dear all,**

As President of the Scientific Committee, I am pleased to inform you that the Consortium for the Protection of Mozzarella di Bufala Campana and the University of Naples "Federico II" are organizing the first International Conference on Buffalo Mozzarella and Milk Products (BMMP), which will be held in Naples, at the UNINA Conference Rooms complex, on 24-25 September 2024 ([www.bmmp2024.it](http://www.bmmp2024.it)).

The BMMP 2024 conference aims to represent an international meeting point between veterinary and animal sciences and the world of the dairy sector, involving researchers in a discussion relating the interactions between the worlds of primary production, processing and marketing of dairy products deriving from buffaloes, known throughout the world.

Buffalo breeding is a topic of research and interest in many countries around the world and, given the huge presence of farms in our region, the BMMP 2024 conference represents a unique opportunity, able to offer the possibility to sector experts such as researchers, veterinarians, breeders, producers and international technicians to exchange ideas and studies, create connections and collaborations to allow an update on all aspects and innovations of the world of the buffalo dairy supply chain, from farm to fork.

The event will focus in particular on news relating to the supply chain, the sustainability of production and their quality, aims that can be achieved using both cutting-edge technologies and ensuring compliance with food safety.

**Angela Salzano**

University of Federico II- Naples, Italy



FIRST INTERNATIONAL CONFERENCE ON

# Buffalo Mozzarella

& Milk Products

24 and 25 September, 2024  
Naples, Italy

Conference Centre of the University of Naples Federico II

Via Partenope, 36, 80121 Naples (IT)

[bmmp2024.it](http://bmmp2024.it)

## About the Event

Buffalo farming is now an almost worldwide phenomenon, for this reason the BMMP is an unique opportunity which enables **international researchers, veterinarians, breeders, producers and technicians** to exchange ideas and information, **make connections** and **collaborations** and update innovations within all the aspects of interactions among the world of buffalo dairy chain, from farm to fork.

## Sessions

-  **01 Buffalo dairy products**  
Production and techniques; Nutraceutical quality
-  **02 Buffalo milk processing**  
New technologies in dairy chain; Food safety
-  **03 Buffalo market**  
Sustainability of dairy chain; Economic impact

## Important Dates

Abstract submission	29 Feb. 2024	 <p><b>Bufala Campana Free Tour</b> <span style="float: right;">26 Sep. 2024</span></p> <p>Join us for an exceptional day: Explore a Buffalo farm and cheese factory, visit the Royal Palace of Caserta, and savor a delicious lunch</p> <p><small>Free of charge (first come first served basis)</small></p>
Abstract final approval	20 Mar. 2024	
Registration Deadline	01 Sep. 2024	

## Registrations

	Standard	Reduced <small>Exclusive to students, PhDs and temporary staff</small>	Social Dinner <small>September 24<sup>th</sup> 2024</small>
<b>Registration fee</b> <small>From January 10<sup>th</sup> to September 1<sup>st</sup>, 2024</small>	<b>70€</b> <small>VAT included</small>	<b>30€</b> <small>VAT included</small>	<b>70€</b> <small>VAT included</small>

<p>Main Sponsor</p> 	<p>Sponsoring Institution</p> 	<p>Sponsor</p> 	<p>Patronage</p> 
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# 11<sup>TH</sup> ASIAN BUFFALO CONGRESS

Dhaka, Bangladesh, 2024

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The 11<sup>th</sup> Asian Buffalo Congress will be held in BCDM, Savar, Dhaka October 11-13, 2024. It is being organized by Bangladesh Buffalo Association, Bangladesh Agricultural University, Department of Livestock Services,

and Bangladesh Livestock Research Institute.

BCDM has conference facilities, accommodation facility and also food.

The congress will cover the following program:

	Morning	Afternoon
<b>October 11, 2024</b>	Opening ceremony	key notepapers/country reports, discussion
<b>October 12, 2024</b>	Scientific sessions, discussion Poster presentation	Scientific sessions, discussion Poster presentation
<b>October 13, 2024</b>	General assembly of Asian Buffalo Association, Closing ceremony	General assembly of Bangladesh Buffalo Association Sightseeing of the delegate

## The following scientific sessions will be held:

1. Buffalo breeding and reproduction
2. Buffalo feeding and nutrition
3. Buffalo genomic and biotechnology
4. Buffalo health and adaptability
5. Buffalo industry: Processing technology
6. Buffalo management, economy and sociology
7. Buffalo ecology, climate, welfare and sustainability

The details of program will be available in the website. Website is being prepared and will be opened by the end of this month.

For more information, may be contacted to Prof. Dr. Omar Faruque, President of the Local organizing committee, 11<sup>th</sup> Asian Buffalo Congress, Dhaka, Bangladesh. E mail: [faruque\\_mdumar@yahoo.com](mailto:faruque_mdumar@yahoo.com) or [bdbfassoc.2022@gmail.com](mailto:bdbfassoc.2022@gmail.com)

*Buffalo for Safe Food  
and Sustainable Production*

# 11<sup>th</sup> Asian Buffalo Congress, 2024

11 to 13 October, 2024

BCDM, BRAC, Savar  
DHAKA, BANGLADESH



## Activities

### Day-1

*Morning*

**Opening ceremony**

*Afternoon*

**key notepapers/country reports, discussion**

**Poster presentation**

### Day-2

*Morning*

**Scientific sessions, discussion**

**Poster presentation**

*Afternoon*

**Scientific sessions, discussion**

**Poster presentation**

### Day-3

*Morning*

**General assembly of Asian Buffalo Association,  
Closing ceremony**

*Afternoon*

**Local Tour and Sight Seeing**

## Scientific sessions

- Buffalo ecology, climate, welfare and sustainability
- Buffalo breeding and reproduction
- Buffalo feeding and nutrition
- Buffalo genomics and biotechnology
- Buffalo health and adaptability
- Buffalo industry: Buffalo Products Processing technology
- Buffalo management, economy and sociology

## Registration fee

Category	Early Bird 20 August, 2024			After 20 August, 2024/ on Arribal		
	Bangladesh	SAARC COUNTRY	OTHER COUNTRY	Bangladesh	SAARC COUNTRY	OTHER COUNTRY
Delegate	TK. 7000	\$ 200	\$ 300	TK.9000	\$ 250	\$ 350
Student	TK.1000	\$ 100	\$ 150	TK.1500	\$ 150	\$ 250
Accompanying Person	TK.1000	\$ 100	\$ 150	TK.1500	\$ 150	\$ 250

Account Name : Asian Buffalo Congress  
Account Number : 0141901048056  
Branch : University Campus  
Bank Name : Pubali Bank Limited, Mymensingh

## Important dates

- Abstract submission deadline: 30<sup>th</sup> June, 2024
- Abstract final approval: 20 July, 2024
- Registration deadline: 20 August, 2024

For further Information, Please contact  
**Prof. Dr. Md. Omar Faruque**  
President of Local organizing committee, Asian Buffalo  
Congress-2024, Dhaka, Bangladesh  
Phone : +88 01714-075435  
Watsapp : +88 01799-204208  
E-mail : bdbfassoc.2022@gmail.com



# XI BUFFALO SYMPOSIUM OF THE AMERICAS AND EUROPE

## Santa Cruz, Bolivia, 2025

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In September 2025, Santa Cruz - Bolivia, will host the XI Symposium of Buffalo of the Americas and Europe, set against the backdrop of the country's breathtaking beauty. Bolivia is deeply honored to extend a warm invitation to participants from across America, Europe, Asia, and around the globe to join us for this prestigious event.

We eagerly await the presence of our buffalo friends, inviting everyone to join the grand buffalo celebration. With open arms, we look forward to fostering connections, sharing experiences, and reinforcing the unity that binds us all.

The Buffaleros of Bolivia seek your assistance, knowledge, and support to nurture and expand the presence of this remarkable species in our corner of the world—a species that generously contributes without expecting anything in return. Your help is crucial for our flourishing and growth.

Your collective presence has the potential to usher in a transformative era in buffalo breeding. Bolivia's expansive plains offer an ideal environment for the easy adaptation of buffalo. Unfortunately, due to a lack of knowledge among our ranchers, this promising opportunity remains untapped. We extend a global invitation, urging everyone to visit, join us, and collaboratively enhance the prospects of this endeavor. Together, we can achieve greatness.

The symposium's primary objectives center on showcasing the virtues and advantages of buffalo. We aim to ensure a hands-on experience, making it a practical event where participants gain tangible insights to be applied directly in their fields.

We envision everyone leaving with practical knowledge

ready for immediate implementation.

The symposium will touch on some topics and aims to cover topics of widespread interest for all breeders, including:

- The Buffalo's role in Regenerative Livestock Farming. - Effective management of buffaloes in extensive fields and plains.
- Exploration of buffalo production costs and profitability.
- Evaluation of buffalo meat production costs in various Bolivian landscapes.
- Integrating Buffalo into Agroecology and holistic systems.
- Techniques for grassland management.
- Assessing buffalo adaptability across diverse climates.
- Examining the buffalo's impact on peasant communities through successful business programs. And much more.

May God bless you! Thank you.

**Ing. Luis Quiles Skorc**

President of the Association of Buffalo Breeders in Bolivia - ACBB

# SEP 2025



**BOLIVIA**

# XI SIMPOSIO BUFALOS

DE LAS AMERICAS Y EUROPA



INTERNACIONAL  
BUFFALO  
FEDERATION



FEDERACIÓN AMERICANA  
DE CRIADORES DE BÚFALOS

# 14<sup>TH</sup> WORLD BUFFALO CONGRESS IN ITALY

Naples, Italy, 2026

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## Dear IBF members,

receive cordial greetings from Italy on behalf of our community, all gathered around water buffalo constituted by academicians, scientists, the National Association of Buffalo Breeders (ANASB), the RIS Bufala Association and The Consortium of Safeguarding of Mozzarella di Bufala Campana Cheese.

On this occasion, we are pleased to host the 14<sup>th</sup> World Buffalo Congress in 2026. Italy has many years of experience and tradition on buffalo breeding and, hence, will organize a great and prestigious event. Moreover, this event will be within the celebration for the 800 years of our main University, the “Federico II”. Eight hundred years of training, tradition, innovation, growth. Federico II University will begin projects and events that will develop along the entire path that will accompany it to reaching the historic goal. In this context, we are delighted to host the next IBF conference during these celebrations.

Buffalo farming in Italy is still growing, has a thriving market and is one of the most technologically advanced in the world with brand new technologies such as i) automated milking systems to control milk quantity and quality, ii) electric feeders able to give the precise amount of food required, iii) wearable or environmental sensors to monitor animal health and welfare. These systems allow scientists, technicians, and breeders to control all aspects of the herd.

The Department of Veterinary Medicine and Animal Production of Federico II University of Naples is also the place where the first course of precision livestock farming (PLF) in the world was born. The course is held

in English and in a residential form, at the Regional farm “Improsta”.

We are confident that host this event will be a great stimulus to keep strengthening and developing buffalo production across the countries and spread the Italian Mediterranean Buffalo breed around the world. Our common region is eager to receive, exchange, and promote knowledge, ideas, advances, and new technologies about water buffalo management, development, production, and industry, implying an incredible milestone for the growth, buildup, and water buffalo impact on our society.

We would be delighted to host you to visit our beautiful land, rich in history and tradition, marvellous places and delicious food to meet our people, exchange culture, and simultaneously witness buffalos’ farming activities in the place where the Italian Mediterranean Buffalo breed is born and raised.

Sincerely yours,

**Prof. Giuseppe Campanile**

President of the  
International Buffalo Federation (IBF)





## INTERNATIONAL BUFFALO FEDERATION

The IBF's complete organisational chart can be viewed at the link below.  
(<https://internationalbuffalofed.org/about-us/>)

**International Buffalo Federation**  
c/o CREA

via Salaria 31  
00015 Monterotondo  
Italy

<https://internationalbuffalofed.org>

[info@internationalbuffalofed.org](mailto:info@internationalbuffalofed.org)

 Facebook [link](#)

 Twitter [link](#)

 YouTube: [link](#)