Buffalo Newsletter

Number 7 - June 1997

EUROPE - NEAR EAST

INFORMATION BULLETIN OF THE FAO INTER-REGIONAL COOPERATIVE RESEARCH NETWORK ON BUFFALO

from the editor

We believe that' s time to see what is the situation of the Buffalo Network after four years activity.

Although the Buffalo newsletter is circulated in 98 countries of the world, and we are proud of it, we must not forget that it is the information bulletin of the **research network of Europe and the Near East**, conceived by FAO to promote the exchange of information between researchers of the two regions. Beyond the organisation of three specific symposia (products, reproduction and production systems) and the publication of seven issues of the newsletter, efforts were done by the coordination centre in order to establish good and steady contacts in each country. We believe that we succeeded and we can now start to think of more involving future activities.

We announce here the finishing touch of the development of communication between countries: the web page on Internet of the Buffalo Network at **http://www.inea.it/isz/newnet.htm**. Do enter this page if you want to keep updated with the new activities and the content of new issues of the newsletter.

One country, Turkey, has already replied to the invitation of the coordination board (see Buffalo newsletter n. 6, page 12) and submitted a **project profile** which will be discussed during next meeting. We took this reply as an evidence of will of working together.

We are preparing a **special session** on Wednesday 15 October 1997 , during the Fifth World Buffalo Congress. In this session each coordinator of the member countries will give a **presentation of the goals in buffalo research and a description of the research structure, organisation and the main ongoing projects**. We are also preparing a directory of research Institutes and researchers (names, addresses and telephone numbers) of Europe and the Near East and a list of recent available publications.

Two new countries joined the Network, and we are now 12. The first is **Hungary**, where four buffalo herds are located on the territory of four national parks, kept for genetic conservation purposes (altogether 200 breedable females). The second is **Azerbaijan**, and you will read a description of buffalo population in this country in the next issue of the Buffalo newsletter.

The genetic evaluation of buffaloes in the member countries as well as the exchange of semen are going to be tackled by a group of experts of the Interbull committee and we think to soon be able to inform you of their proposals.

Moreover, we thank very much prof. Jean Boyazoglu, Senior Officer of the FAO Regional Office for Europe, who has cooperated to the establishment of the Buffalo network and has contributed to its development through helpful suggestions and financial support.

He his leaving his post at FAO Rome in June 1997, persuaded to return to the post of Secretary General of the European Association of Animal Production, in which he is also Vice-President, the International Committee for Animal Recording (ICAR) and the World Association of Animal Production. Although we will miss him on the FAO side, we are sure that he will still be of a great help to us at EAAP.

Finally, we thank all scientists and technicians who have given a contribution to the Buffalo newsletter and invite everybody to send news and various items on buffaloes. We believe that this bulletin is still a good tool for communication and confrontation.

Giancarlo Rossi

INSIDE THIS ISSUE

ANALYSIS OF PRODUCTION TRAITS OF BUFFALO IN SRI LANKA

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INTRODUCTION

An attempt has been made to review the studies carried out by the author on buffaloes in Sri Lanka. These studies aimed at the evaluation of the production performances of the indigenous buffalo under village conditions and the analysis of the effects of repeated back crossing to an improved breed (Murrah) over five to six generation.

Milk yield will be here referred sometimes in litres and sometimes in kg, according to the relevant research. State farms were in fact supplied with scales and milk was weighed, while in field farms milk was measured in bottles (litres).

PERFORMANCE OF SWAMP BUFFALO

The first investigation was a survey of 80 farmers to study buffalo farming and production levels in Polonaruwa and Mannar districts of Sri Lanka. Ninety-five percent of the farmers cultivated either paddyland and/or highland and all used indigenous buffaloes. The shortage of grazing land was the major limitation to buffalo farming in both districts. The age at first calving , calving interval, number of calves/life time were 44 months, 14.5 months and 9 calves respectively. Milk yield and lactation length were 1.6 litre/day and 6.5 months respectively. Buffalo cows that were grazing longer had 2-3 months shorter calving intervals, were 2-3 months younger at first calving and produced 1.5 litres more milk per head and per day and 4 more calves per lifespan. Milked buffaloes had four months shorter calving interval than those not milked.

Calving intervals were two months shorter and milk yields were higher among dams that were not worked in the fields . On an average Polonaruwa district animals produced 28 litres more milk than those of Mannar (317 litres) in a lactation.

PERFORMANCE OF CROSSBRED (MURRAH X SWAMP) BUFFALO

In the second investigation, data from the first four lactations over an eleven year period from 1971 to 1981 on 273 pure Murrah (M) and 233 Murrah Grades (GM) from the Ridiyagama Farm (Sri Lanka) were used in the analysis. The total number of calvings over this 11 year study was 820 for M and 774 for GM. Although the first calving occurred at almost the same frequency in the season called 'maha' (Nov-April) and 'yala' season (May-Oct) in the M and GM groups, subsequent conceptions and calvings occurred in a ratio of 3:1 in maha and yala respectiveely. Murrah heifers had their first calving at the age of 50.7 months while the Murrah Grade heifers calved at 48.7 months, the difference being statistically significant ($P<0.05$). Male calves outweighed females at birth by 830 grams. Over the eleven year study period, within the crossbred buffalo cows, a mean reduction of 0.39 kg of birth weight and an increase of 1.8 months per year of age at corresponding calvings was observed.

The 305 days adjusted milk yields of M breed were 1501, 1533, 1488 and 1364 kg at I, II, III and IV lactations while the respective figures were 1359, 1342, 1271 and 1258 kg for GM. Milk yields differed among breeds ($P<0.05$) for all lactations except the fourth. The least square means for the first, second, third and fourth lactation lengths of breed groups pooled were 359, 327, 319 and 314 days . The means of the first, second and third calving intervals were 640, 507 and 485 respectively.

A mean reduction of 80.1 kg milk in a 305 day milk yield and 4.5 day in lactation length was observed over the study period. Animals calved in yala had 102 litres and 21 days more in the milk yield and length of lactation at II and III lactations than in maha. Buffalo cows conceived during August to October had 136 days shorter ($P<0.01$) calving interval than dams conceived during January to March at third calving. Therefore in addition to its effect on calving pattern, season was also found to influence milk yield, lactation length and calving interval.

SYNTHESIS AND DISCUSSION

The indigenous buffaloes are about 95% of Sri Lanka buffalo population. These animals constitute a major source of farm power in the rice growing regions of the country. However, since the animals are required for this purpose during part of the year only, farmers in certain areas like to rear buffaloes for a real dual purpose (draught and milk) .

These studies attempted to evaluate the production performance of the indigenous buffaloes and to study the effects of repeated crossing. It was seen that the indigenous buffaloes have a very low potential for milk production, the yield being only 345 kg per lactation. The present study also showed the potential existing for the improvement of the lactation

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capacity through upgrading Murrah, a recognised dairy breed of buffaloes.

Compared to the production of the indigenous buffaloes, the milk yield of the Grade Murrah was increased by approximately 390% over a 30 year upgrading program. The effect of breed on birth weight was not significant suggesting that the indigenous type has been upgraded to the level of the Murrahs with respect to this trait. Upgrading has been effective in increasing the birth weight and lactation length from 17 kg and 195 days to 20 kg and 305 days respectively. Although it appears that calving interval and age at first calving have been increased due to upgrading, since these traits are largely influenced by the environmental or management criteria, one cannot attribute this effect to a result of upgrading only. Early introduction of bulls into breeding herds, maintaining sufficient number of bulls, eliminating the seasonal behaviour of the buffalo, and improvement of nutrition and selection for short calving interval and age at calving, are measures most likely to achieve an improved reproductive efficiency.

The breeding pattern of the buffaloes both in the field and in the state farms was characterized by marked seasonal variation. Seasonal variation is a problem of great importance in buffalo husbandry because it leads to marked variation in milk supply between seasons. Provision of regular wallowing facilities, abundant green grass and artificial reduction of daylight have been shown experimentally to alter the seasonality of sexual behaviour in buffaloes. Significant variation for all the considered traits were observed between the years. The differences between years could be attributed to the managemental and environmental variations especially in the variation of the feeding standards over the years.

This was further supported by the observation in the field study when the production traits were found to be influenced by feeding patterns and management practices. Despite the potential for genetic improvement through crossbreeding and despite the upgrading program being started as early as 1948, it is evident that the Murrah breed has not had much impact on the national buffalo population and the indigenous buffaloes constitute about 95% of the population.

It would be useful to understand the reason for this. Bull calves born in the state farms were being issued to the farmers to upgrade their indigeneous animals. The crossing of river and swamp buffaloes usually occurs only when the animals are reared together from birth or where such breeding is deliberately promoted, e.g. by artificial insemination (Madevan, 1992).

Indigenous buffaloes are much more efficient in breeding than Murrah bulls in a common grazing ground of the dry zone. Furthermore, it is also known that the Murrah breed is more sensitive to nutritional inbalance that occurs due to seasonal variations. Murrah requires an intense management which is unlikely in the dry zone condition.

One of the quickest ways of achieving rapid genetic improvement is by artificial insemination (AI). AI in buffaloes is not practiced in the dry zone of Sri Lanka due to the lack of trained and proven bulls for semen collection and furthermore not much work has been done on the evaluation of different diluents for the preservation of buffalo semen and other various aspects of AI.

Finally, the present low level of milk production in the dry zone was attributed to the subsistence orientation and to the selection of bulls for draught. All these oculd be some of the reasons why the expected improvement has not taken place.

CONCLUSION

Upgrading at Ridiyagama State Farm (Sri Lanka) has resulted in an improvement of birth weight, milk yield and lactation length but has had no effect on calving interval and age at calving. The observed mean reduction in milk yield and birth weight per year may be attributed to genetic deterioration and limitation in the level of management. Unless more genetic variability could be incorporated into the gene pool. further progress in milk production and birth weight is likely to be restricted.

The present study suggested that in order to decide on an optimum combination of indigenous and Murrah inheritance in a crossbreeding programme, Grade Murrah bulls also could be used for semen collection for AI in the dry zone.

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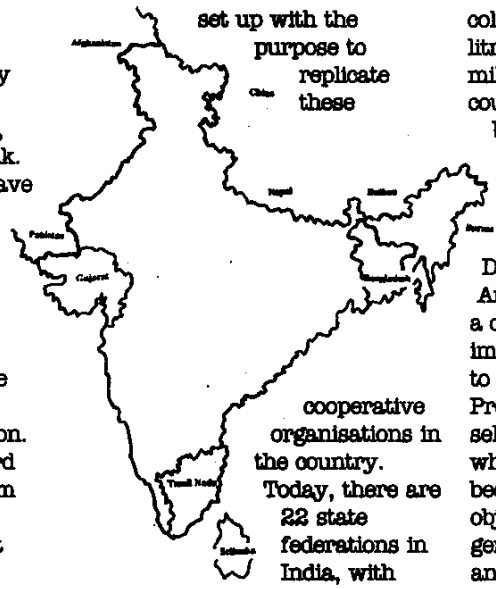
DAIRY HERD IMPROVEMENT PROGRAMME ACTIONS (DIPA)

Kamlesh R. Trivedi

National Dairy Development Board, Anand 388 001, Gujarat State, India

In many parts of India, particularly in the Western and Southern states, very large dairy cooperative organisations have come up primarily for collection, processing and marketing of milk. These cooperative institutions have usually two or three levels of organisational structure. At the village level, farmers form a dairy cooperative society managed by their elected representatives. All village level cooperative societies of the same district, federate into a district cooperative milk producers' union. The union is managed by a board of directors, the majority of them elected by the chairmen of the village cooperatives. The district cooperative unions of one state, form a federation at state level, which is managed by the representatives of the district unions. The National Dairy Development Board (NDDB) was set up with the purpose to replicate these cooperative organisations in the country.



Today, there are 22 state federations in India, with altogether 170 district cooperative unions, 70,000 village cooperative societies, representing **9 million farmers**. These organisations together collect and process some 10 million litres of milk daily, of which 5.6 million litres is buffalo milk The country has about 40 million adult breedable female buffaloes, producing 37 million metric tonnes milk per year.

The National Dairy Development Board (NDDB) of Anand (Gujarat state) has launched a comprehensive breed improvement programme, referred to as Dairy Herd Improvement Programme Actions (DIPA), in selected milk sheds in the country, where the infrastructure for AI as been well established. The main objective is to achieve desired genetic changes in selected cattle and buffalo population. Only data relevant to buffaloes will be here reported.

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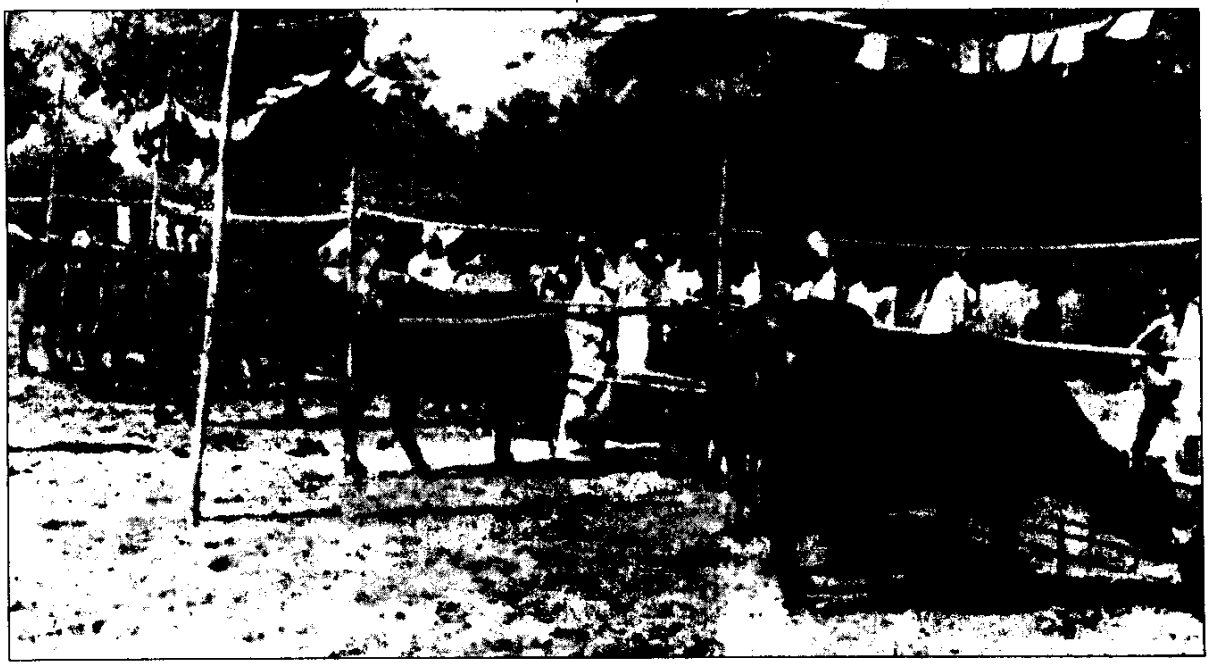
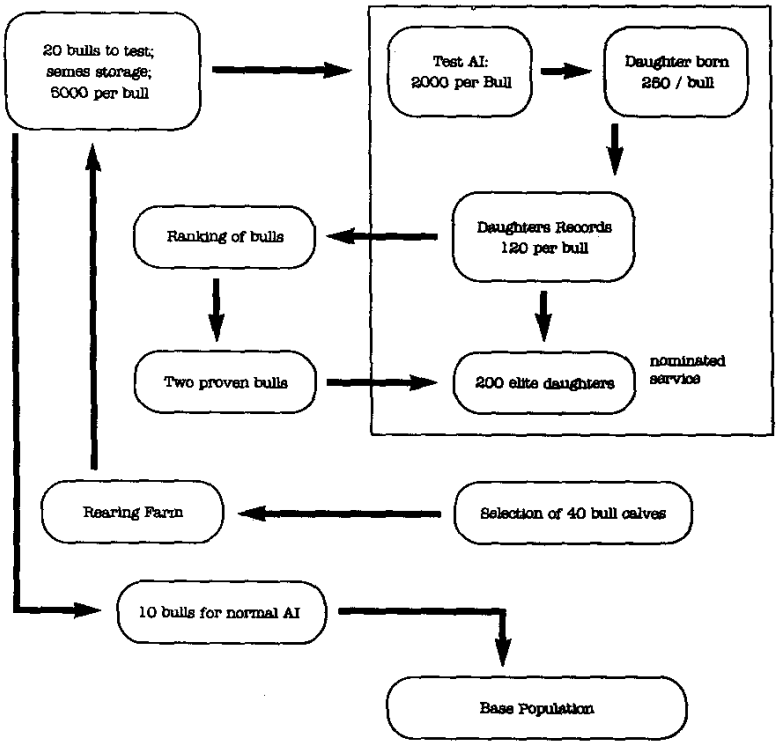


BUFFALO HEIFERS FROM PROGENY TESTED BULLS AT MEHSANA MILK UNION

Figure 1: Schematic Presentation of Progeny Testing Programme



PROGENY TESTING OF BULLS

The programme concentrates on increasing genetic gain through the selection of sires to breed sires and the selection of dams to breed sires (fig. 1). Higher genetic progress under the sire to sire path is sought to be achieved through increasing selection intensity, increasing accuracy of selection of sires and reducing generation interval as much as possible. On the dams to sire path, a high genetic progress is planned to be achieved through increasing selection intensity in dams to produce sires and an increasing accuracy of selection of dams. A few selected bulls, once they have completed their test mating, are used in routine AI which ensures transfer of high producing genes into the base population.

A set of 20 bulls are put to test every year. To generate roughly 100 completed first lactation records of progeny per bull, some 2000 doses of frozen semen of each bull are distributed in the selected villages, ensuring that the number of daughters born for each bull in each village across all villages will roughly be the same. Apart from the release of test doses, some 5000 doses of semen per bull are stored till the results of bulls put to test are available. The stored semen doses of the top two bulls are used for nominated service on the elite recorded animals to produce the next generation of bulls.

Milk production and fat percentage of each daughter are measured once a month till it completes lactation or till ten monthly records are obtained. Data of AI, pregnancy diagnosis, calving and milk recording are collected through the Management Information System (MIS-DIPA), a PC-based integrated management information system.

Table 1 (page 6) summarises the progress made under different DIPA programmes.

The progeny test at Mesbana district started in 1987 and so far five sets of bulls have completed their test mating and the sixth set of bulls is under test. The overall sample average first lactation yields of daughters which completed their lactation was 1917 ± 380.4 litres (no.=2810) and the sample average of age at first calving was 42.9 ± 8.07 months. The progeny test results of the first three batches of 33 bulls are

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DEMONSTRATION OF ANIMAL HEALTH CARE AT THE MILK UNION TO THE TRIBAL FIRST-AID WORKERS OF BHARUCH.

follows from page 5 / DAIRY HERD IMPROVEMENT PROGRAMME ACTIONS (DIPA)

Table 1. Progress made under different Dairy Herd Improvement Programme Actions

Buffalo

Set No.	No. of bulls	AI per bull	Daughters: Born & regd.	Daughters: Under recording	Daughters: Average Lactation milk yeld	No. of bulls	AI per bull	Daughters: Born & regd.	Daughters: Under recording	Daughters: Average Lactation milk yeld
Mehsana: Mehasana buffaloes; since 1987						Kheda: Murrah buffaloes; since 1989				
1	13	1714	2537	983	2047 (663)	13	5032	1786	334	1539 (117)
2	20	1392	2708	1118	1906 (634)	16	4844	2959	68	
3	12	2716	3149	554	1889 (476)	17	3817	1711		
4	15	1493	2437							
5	12	1831	475							
6	12	1600								
Tamil Nadu: Murrah buffaloes: sinse 1987						Baroda, Sabar, Godhra: Murrah buffaloes since 1992				
1	17	590	1091			10	1898	2493		
2	13	926	1188			10	2015	2337		
3	20	1143	1923			10	2049	804		
4	20	1250	1714							
5	20	862	556							

Figures in parenthesis indicate number of observations of complete lactations.

now available. Breeding value was estimated using the following model:

Y=Wa+Xb+Zc+e

where Y=observation vector consisting of 305-day standard first lactation yield of daughters (no.2655),

a= effect of age at first calving assumed as quadratic continuous variable,

b= vector of village-year-season effects (no. 243),

c= vector of random sire effects (no.45),

W, X, Z = known matrices,

e =vector of random residual effects.

The heritability of milk yield was estimated to be 0.12. The best linear unbiased estimates of the top ten sires are given in table 2.

In Kheda district, the testing of Murrah buffalo bulls started in 1988. So far, two sets of bulls have completed their test mating and the third set is under test. Some 334 daughters of the first set of buffalo bulls and 68 of the second set are under milk recording.

The DIPA programme for the Sabarmati Ashram Gaushala (SAG), Bidaj and Baroda, Panchmahal and Sabarkantha district cooperative unions was initiated in 1993. So far, 30 buffalo bulls have completed their test mating and another 10 buffaloes are under test. Some 3179 buffalo dams are under milk recording.

In Tamil Nadu the programme for Murrah buffalo bulls started in 1987. So far, five sets of buffalo bulls have completed their test mating.

INFORMATION TECHNOLOGY AND DECISION SUPPORT SYSTEMS

Geographical Information System (GIS) based decision support is being implemented in 12 milk unions in Gujarat for efficient management of 1) milk procurement and production, 2) village societies, 3) veterinary and 4) AI services.

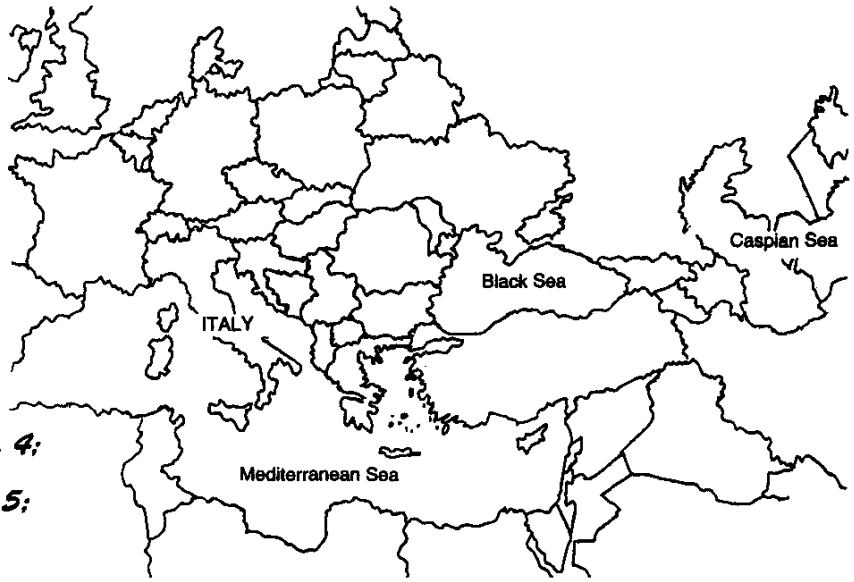
Eight unions have been equipped with the required computing facilities and supplied with base module for GIS for management of milk procurement and production enhancement activities and their staff have been trained for this purpose. Three sub-committees one for milk procurement and production, the second for veterinary information system and the third for AI information system have been constituted in order to oversee the implementation of various information systems. Total animal enumeration was carried out in 12 districts in order to create the basic information on the existing milk animals. Systems have been standardised for collection of data from dairy cooperative societies, veterinary and AI services.

Table 2 - Best linear unbiased estimates of top 10 sires

Bull	No.obs	No.villages	Breeding value
85	43	15	+162.7
20	81	10	+151.0
88	72	15	+120.2
64	58	16	+109.6
24	39	9	+108.3
49	28	9	+108.1
54	90	16	+97.7
27	59	15	+96.8
75	32	10	+85.0
73	57	13	+67.1

Photos were taken from NDDB Annual Report (1995-1996)

In each issue of the Buffalo Newsletter a description of Buffalo farming in every member country is presented. Egypt and Syria appeared in n. 3; Bulgaria and Albania in n. 4; Turkey and Romania in n. 5; Iraq in n. 6.



BUFFALO POPULATION AND PRODUCTION IN ITALY

1 - ORIGIN:
River buffalo.
- **Breed:** Meditrranean.
- **Crossing:** None.

2 - GEOGRAPHICAL AREAS:
97% of the buffaloes are in the centre and the south of Italy (45% in the districts of Caserta and Salerno) ; 3% in northern Italy.

3 - NUMBER IN 1995:

adult females	100,000
adult males	3,500
young stock	58,000
TOTAL	161,500

the number is slightly increasing: 2% per year

4 - HERD SIZE:
n. herds: about 1,100

private herds: 1,100;
adult females: 100,000;
adult males: 3,500
young stock: 58,000

research herds: 1;
adult females: 120;
adult males: 6;
young stock: 90.

industrial herds: non existing.

5 - DESCRIPTION:
(see table 1)

6 - PRODUCTIVITY:
N. DAYS LACTATION/YEAR:
266.
LACTATION MILK YIELD (KG):
kg 1970 (average of 15,378 milk recorded lactations).
AGE AT FIRST CALVING (MONTHS):
28 to 39.
AGE AT SLAUGHTER FOR YOUNG STOCK:
male 18 months; female not slaughtered.
WEIGHT AT SLAUGHTER FOR YOUNG STOCK:
male 350 kg;
female not slaughtered.
(few males are fattened to slaugther age; the majority are let to die after birth for lack of care due to the low price of buffalo meat, and high milk price).
- IS THE CALF SUCKLING?
Not from his mother. However, 40% ofcalves of all Italian population suckle under old buffaloes or dairy cows kept at the farm for this purpose.
- ARE COWS MILKED ONCE A DAY?
Only 15% in Caserta and Salerno.
- ARE COWS MILKED TWICE A DAY?
87%.
- ARE COWS MILKED BY HAND?
Only in rare cases (1%).
- ARE COWS MACHINE MILKED?
yes, all.
- TYPE OF MACHINES:
milking parlours: herring bone (2%) or tandem (98%). In small farms with no milking parlour (estimated

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Table 1.

	ADULT MALE	ADULT FEMALE
- HEIGHT AT WITHERS	140 cm	138 cm
- WEIGHT	800 kg	650 kg
- COLOR	from brown to black	

follows from page 7 / BUFFALO POPULATION AND PRODUCTION IN ITALY

milked buffalo percentage = 7%) other milking machines are used (bucket or milkpipe).

7 – FERTILITY:
N. CALVES/YEAR: **0,8.**
SEASON OF CALVING:

Jan+Feb+March+April	**44%**
May+Jun+Jul+Aug	**40%**
Sep+Oct+Nov+Dec	**16%**

The above percentages were obtained after forcing calving season: buffalo would spontaneously calve from September to December.

8 – HOUSING:
- Loose housing 95% tied 5% (in Frosinone area).

9 – ARE BUFFALOES USED FOR DRAUGHT? No.

10 – SOURCE OF FEEDING:
(percentage components of the common ration in the average type of farm):
28 maize silage and spring silage;
25 hay and straw;
13 byproducts (tomato peels, vegetable and fruit byproducts);
34 concentrates;
35% of total Italian buffalo population from April to October is fed grazing of fresh greent forage.

11 – TOTAL ANNUAL PRODUCTION BY SPECIES.
(see table 2).

OTHER PRODUCTS FROM BUFFALO: **No.**

12 – MILK RECORDING:
22,300 milk recorded buffaloes.

13 – REPRODUCTION:
HAS EACH FARM ITS OWN BULL? **Yes, 1 out of 30 females.**
ARTIFICIAL INSEMINATION? **Yes, for progeny testing less than 2,500 buffaloes inseminated every year.**

14 – DISEASES AND PARASITES:
Brucellosis, salmonellosis, clostridia, strongylosis, theileriosis, acari, lice, ticks.

15 – SOCIAL POSITION OF BUFFALO FARMERS.
Medium-high.

16 – PERSPECTIVES OF BUFFALO PRODUCTION:
Although the demand for mozzarella is going to increase, buffalo population is going to remain constant in the short term due mainly to brucellosis.

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Table 2. Total animal production by species (metric tons) year 1995.

	N. ADULT FEMALES	TOTAL MILK	CONSUMED FRESH	CHEESE	BUTTER	MEAT
BUFFALO	110,000	170,000	-	40,000	-	NOT REGISTERED
DAIRY COW	2,167,000	10,000,000	118,000	718,000	93,000	933,000
EWES	7,898,000	600,000	-	74,400	-	44,000
GOAT	1,200,000	150,000	-	27,000	-	6,500

BUFFALOES IN HUNGARY

Laszlo Karpati

Director, Ferto-Hansag Nemzeti Park, Igatosaga, 9435 Sarrod, rèv. Kocsagvar pf. 4, Hungary

There has been a small but tenacious population of buffaloes in Hungary for many years (Ross Cockrill W., FAO, 1974). They were introduced by the Turks in the sixteenth century, via Bulgaria and Macedonia. Numbers have declined greatly in recent years from 3000 heads in 1960 to 1000 heads in 1971. The decline is attributed mainly to the loss in economic value of working buffaloes.

At present there are a few hundreds of buffaloes

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in four herds which are part of National Parks and work as gene-reserves. They are located in the following areas: Veszprem , Sarrod, Debrecen and Hortobagy. The Editor of the Buffalo newsletter has contacted the managers resposible for these Parks and the director of the National Park of Sarrod , dr. Laszlo Karpati, has positively replied, showing his interest in the activity of the Buffalo network, and his will to be involved into it. He also supplied the following description of buffaloes in Hungary.

In Hungary, the total number of buffalo population is about few hundreds as they serve as gene-centres of the species.
The buffalo herd of the Ferto-Hansag National Park (the population has been growing year by year since 1991) counts 30 buffaloes of all ages. 25 of them are adult female (over 4 years old). 4 of them are young heifers and there is also 1 breeding bull. We would like to enlarge the population number of the herd up to a minimum of 50 breeding cows in the future. Animal products like milk, meat, buffalo hide or even the draught power are not utilised here at the moment. However, this does not mean that this is the final strategy of buffalo husbandry. We have left this question open to think about it. Future conditions will tell the way to be continued.

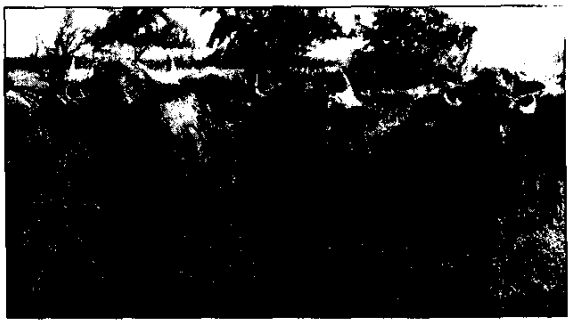
The reason of the buffalo presence in the national park can be summarised as follows:

- Pursuing the method of traditional animal husbandry, which was extensive, of animal keeping taking into consideration the natural habitat conditions at the same time. In this way it is possible to form breeding herds of some traditional Hungarian breeds (like the Hungarian Grey cattle, the Racka sheep and the buffalo).

- In this way we can contribute (through establishing breeding herds, maintaining relations with breed societies, etc.) to the maintenance of home breeds which are endangered because of the shrinking of their population especially after the second world war.

- These breeds have an important role in maintaining wildlife habitat too. Through grazing (chewing and trampling) they help to preserve both the salt effected grasslands and the wet meadows . In fact, on the wet meadows this action helps to forcing back the growing reeds and in the drier parts it represses the expansion of the shrubs and trees. In this way , nature conservation can replace the interference of mechanical and other non-naturefriend methods.

- Finally, we can mention that through keeping these animals, several elements of the traditional pastoral life return back into practice as well. It is a duty to save and value them.



ALL PHOTOS SHOW VIEWS OF BUFFALOES AND HUNGARIAN GREY CATTLE IN THE FERTO-HANSAG NEMZETI PARK IGATOSAGA

WATER BUFFALO IN THE UNITED STATES OF AMERICA

David J. Ligda

International Livestock Project Development Inc. - P.O. Box 211, Portage, IN 46368-0211, U.S.A.

ORIGIN

Prior to the mid-1970s water buffalo (Bubalus Bubalis) were only observed in a few zoological collections in the United States. In May 1975 five animals were imported to the Universiity of Florida from a Canadian zoo to begin the research in the species as a livestock animal. In 1977-78, 53 swamp type animals were imported from the island of Guam in the first commercial importation. These animals were probably of the carabao type with original genetic material from the Philippines. In 1981 a herd of 103 river type water buffaloes were imported from the island of Trinidad. Several smaller importations took place during the next decade including one public sale in 1990 at which 55 Buffalypso (Trinidad type) animals were sold for about $5000 USD on average with the highest price paid as $5700 USD.

In 1987 it was estimated that there was 1200 commercial animals in the US. A decade later, in 1997, this number is estimated at about 2400-3500 total animals in about 20-30 herds. There are no research or industrial herds in the US.

GEOGRAPHICAL AREAS

The largest concentration of water buffalo is in the southern US. The Texas-Arkansas area and Florida having the most animals, but a number of small (3-5) herds exist throughout the US.

PRODUCTIVITY

No real registration or collection of water buffalo production statistics is done in the US, so true productivity is difficult to estimate.

Because of the small size of the national herd, water buffalo production is mainly breeding animals with calves consuming all milk produced.

Until recently (Feb. 1997) one US herd produced milk that was processed into mozzarella cheese. This arrangement was terminated in Feb. 1997 and there does not appear to be a source of domestic water buffalo cheese at the present time. A few of the larger herds use machine milking and sell milk locally for blending with cattle milk. Expected production is about 4-8 litres per day and a 240-280 day lactation.

Small amounts of meat are produced for the custom local markets. However, no national market for meat exists. Animals are usually slaughtered at 18 months and about 1000 to 1200 lbs. (450-550 kg). An average of 55% useable meat is expected. In 1997, estimated prices for heifers are $4000 USD. A bull $1000 to $1500 USD. A bred buffalo cow costs about $6500 USD.

REPRODUCTION

First calves are usually produced about 24 to 36 months of age. No artificial insemination is done and there is no source of frozen semen. Efforts are made to produce a calf every 13-14 months.

HOUSING

Most animals are raised in a pasture grazing system with some covered free stall housing provided in the colder parts of the country. Although the majority of buffalo are raised in the warmer areas of the country , in some areas there is average 40 (100 cm) inches of rainfall a year, primarily during winter months. Winter temperature can also range from 15 F (-10 °C) to 50 F (+10 °C). Wind chill can go down to 0 F (-18 °C)

FEED

Some water buffalo are fed only pasture and some are given concentrate, haylage or maize silage. One breeder/raiser that milks his animals feeds 3 to 5 pounds (6.6 to 11 kg) a day of cottonseed and a dairy blend (a 16% protein ration).

Another, who uses more pasture and roughage, feeds a good quality hay, average of 18 lbs (8.2 kg) a day/per animal and does not give any supplements.

PERSPECTIVES

Buffalo in the US are presently considered to be an alternative and exotic livestock animal. The production and sale of breeding animals is the main source of income. Recently US farmers have become more interested in pasture based, low concentrate dairy production systems with more focus on lower cost production and of smaller quantities of high quality products. The water buffalo fits well into this type of programs and perhaps we will begin to see larger market develop for milk, cheese and meat products.

THE EXPERIMENTAL BUFFALO FARM IN BRAZIL

Pietro Sampaio Baruselli

Researcher of Experimental Buffalo Farm - Br 116, Km 435, cx 134 - Registro - SP - Brazil - 11.900.000

Very well adapted to Brazilian environment, buffalo herds are mainly concentrated in the Amazon Region and reach an estimate of 2.5 million heads (Buffalo Breeders Brazilian Association). Compared to cattle, buffalo have shown better fertility and production rates; less heat stress suffering and more milk and meat convertion from poor quality forage. They become, thus, a potential animal protein source, particularly for those small farms with limited grazing capabilities, peculiar in tropical regions.

Four breeds are spread throughout Brazil: Murrah, Mediterranean, Jafarabadi and Carabao. River breeds (Murrah, Mediterranean and Jafarabadi) have been used with great success for meat and milk production. The swamp breed (Carabao), raised mainly in the northern region, has been efficiently used for work and meat production. Buffalo meat in Brazil has excellent quality and good palatability. On pasture conditions, buffalo are slaughtered near 2 years of age weighing about 450 kg. Nowadays, buffalo meat is successfully served with success in the best restaurant of the largest Brazilian cities. Buffalo milk production is increasing each year and has already reached a peak of 2.800 kg/lactation/cow in the best farm. On pasture conditions, however this value lowers to 1.100 kg. Special cheese industry is another area that has shown constant improvement.

Researches performed in Brazil, based on tropical field conditions furnishes evidence that buffalo can be bred more efficiently than cattle due the following reasons:

- better growth performance;
- earlier maturity;
- higher calving percentage rates and shorter calving intervals;
- lower calf and adult mortality rate;
- greater longevity .

Therefore, these characteristics make buffalo greater sources of protein production in tropical pasture conditions.

However, in Brazil as in other countries in South America as well, buffalo and cattle are similarly managed. Further proper buffalo management studies are needed to demonstrate how, compared to cattle, they behave alike.

The Experimental Buffalo Farm, of Animal Science Institute (Instituto de Zootecnia) in Registro - Sao Paulo State, Southeast of Brazil, developed and sponsored by the Government of Sao Paulo, was established in 1986. The Institute goals are to attend breeders needs, to support and properly correct the buffalo breeding practice.

Among the different research areas performed in the Experimental Buffalo Farm and on private farms as well, some may be cited:

REPRODUCTION RESEARCH

A. Reproductive management:

Interaction among local environmental factors and reproductive performance were carried out on different farms. Reproductive seasonatility, oestrous behaviour, nutritional status (body condition score) and their correlation with reproductive performance were investigated. Studies on uterine involution, endocrinological profiles, ovarian activity and sexual behaviour has been developed in the postpartum. The results showed that buffalo reach maturity at 2 years of age; calved for the first time near 3 years of age; obtained 80% calving rate; and had a 13-14 month calving interval. These data were influenced by numerous environmental and genetic factors (cow genotype, nutrition, local environment, management practices, semen fertility, herd manager ability to detect estrus, milk production, suckling, age, etc.) and must be considered as potential reproductive performance modifiers.

B. Artificial insemination:

Since 1993, more than 1500 artificial inseminations were performed in 12 dairy buffalo farms and average 1.88 doses/conception (DC) were obtained. The best farms, however, reached 1.6 DC. Overall management is being studied in relation to artificial insemination for efficiency improvement.. Efficacy of different extenders for preserving physical seminal characteristics associated with fertilizing capacity of deep frozen semen are being evaluated. Training courses on buffalo artificial insemination are offered each year.

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follows from page 11 / THE EXPERIMENTAL BUFFALO FARM IN BRAZIL

c. EMBRYO TRANSFER

Ultrasonographic studies on ovarian follicular dynamics are performed to better understand the development of follicles and to improve superovulatory responses in buffalo. Animals are superovulated and daily monitored by ultrasonographic examination. Good superovulatory treatment were obtained, but with a moderate embryo recovery (mean of 2.5). Results for calving after fresh or frozen embryo transfer were positive.

Dr. Pietro Sampaio Baruselli is the researcher in charge of the above projects.

GENETIC RESEARCH

a. MILK RECORD:

Milk records from 14 herds (approximately 700 heads) are monthly carried out and based on production and physical-chemical analyses. From 1995 to 1996, the mixed breed herd obtained a 1.200 kg/lactation /cow milk production for a 270-day lactation. Among some of the best Murrah herds, the production reached 2,800 kg. It must be emphasized, however, that such cows were kept on pasture, milked once a day, and had their calves by their side. Under these conditions, average fat and milk protein were 6.4 and 3.9%, respectively.

Dr. Humberto Tonhati is the person in charge.

b. GROWTH PERFORMANCE RECORD:

Male and female are weighted at birth and in every three months until they reach 1 year of age. Weighings are performed in May, August November and February during each calving season. Weights are adjusted to the time of weaning (205 days) and to one year (365 days); mean and standard deviation are calculated. Top animals are those over the average plus one standard deviation; superior are those between average and one deviation; common are those under average. Only top males are indicated as possible candidates to represent their herds in the feedlot performance tests. With females, however, depending on their breed, health and conformation characteristics, top or superior may be used.

Dr. Joao Carlos Aguiar de Mattos is in charge of this project.

c. FEEDING TEST

Buffalo at the Experimental Farm and on private farms as well, are evaluated for their production performance to identify top bulls. Selected young bulls (13-15 months), produced by artificial insemination or by natural mating are taken to the growth performance test under standardized feeding conditions.

Dr. Joao Carlos Aguiar de Mattos is the project co-ordinator.

NUTRITION RESEARCH

Using three buffalo breeds to be slaughtered at different stages of maturity, the purpose of this area of study are: to evaluate productive performance in feedlots; to determine growth rates of body portions and to examine the influence of nutritional levels on physical traits and body composition. Further research will be conducted to study the empty body composition (energy, protein and macro minerals) and nutrient requirements for the different genetic groups. These data will be utilized to increase the volume of information about the subject and to enable development of nutrient requirement tables for buffalo in tropical conditions.

Dr. Andre Mendes Jorge is the project co-ordinator.

RESEARCH IN MANAGEMENT

Breeding programs on swamp and on dry pastures are developed using once a day milking, 240 days weaning, mineral and roughage supplementation and sanitary control. Average 24 months live weight for males has been 443 kg. Average 300 days adjusted milk production has reached 1,100 kg / lactation/cow. Overall management is being studied in relation to milk and meat production for efficiency improvement.

Dr. Jose Fernando Simplacio de Oliveira is the project leader.

The research studies carried out in the Experimental Buffalo Farm are performed in cooperation with Unversidade de Sao Paulo, Faculdade de Medicina Veterinaria, Departamento de Reproducao Animal and with Universidade Estadual Paulista, Departamento de Melhoramento in Jaboticabal (Sao Paulo State). Further research on buffalo breeding in Brazil and all over the world are needed: to obtain the best benefits from different breeds and to take advantage of the maximum buffalo potential. Such information will be extremely useful for the productive sector and will build scientific basis to overcome negative prejudices among traditional buffalo breeders.

THE IMPORTANCE AND PERSPECTIVES OF EXPLOITATION OF THE BUFFALO POPULATION IN THE KERKINI WETLAND

A.Georgoudis[1], I. Loridas[2]

[1] Aristotle University, Faculty of Agriculture, Dept of Animal Production, Thessaloniki, Greece
[2] Ministry of Agriculture, Dept of animal Production, Serres, Greece

Abstract of a paper presented in the :
'Greek-Bulgarian congress on river Strymon Watershed and lake Kerkini', organized by the East Macedonian branch of the Geotechnical Chamber of Greece, from November 29 to december 3, 1995.

Buffalo, as an indigenous ruminant farm animal, constitutes, from an agro-ecological point of view, a valuable genetic material, which, some decades ago, used to be a productive animal for the Greek farmer and an integral part of the ecosystem of the Greek wetlands.

During the past and at the beginning of the 20th century, buffaloes were spread all over the country. According to data of the Statistical Service of the Ministry of Agriculture, until the end of the '50s, about 70,000-75,000 animals were bred at the swampy regions of Thrace, Macedonia and Thessaly. However, due the modern farming and animal husbandry socio-economic conditions established, the number of buffalo population has been dramatically decreased during the last decades. As a result, the remainings of the Mediterranean sub-type buffalo, found in the wetlands of northern Greece, number today 600 animals in total. These animals belong to 9 farm units, situated in the wetland sites of the Lakes Volvi and Vistonis (in the above photo), in the estuaries of the Rivers Axios and Gallikos, and, mainly, in the wetlands sites of the Lake Kerkini - River Axios. As a consequence and as no stable economic basis in this sector exists, since neither the consumers, nor the agriculturists show any interest in the value of buffalo products, there is immediate danger for the animals to be entirely slaughtered.

Greek specialists in animal husbandry and ecology have pointed out in relative studies, dealing with the relationship of animal production with the wetlands' environment, the unfavourable perspectives for the survival of the remaining small buffalo population. However, they have also indicated that the main characteristics of buffaloes, such as moderate feeding because of the exploitation of swampy pastures and roughage, minimum holding requirements, strong resistance to diseases and ability of producing specialised products, can constitute buffalo farming a productive sector, which will also contribute to the preservation of the regions, where they are bred. Today, there is a general tendency for developing farming and animal breeding methods, which respect the natural resources and for supporting, in the frame of the new regulations of the European Union, the breeds of farm animals threatened by extinction. Thus, together with the immediate profits, which will result from the systematic buffalo breeding, higher absorption of the EU financial subsidies is expected, as well as a significant inflow of money from the increase of the tourists flow, because of the particularity of the buffaloes in the region.

buffalo news - buffalo news - buffalo news - buffalo news - buffalo news

The Buffalo Network has opened a web page in internet at the following site:
http://www.inea.it/isz/newnet.htm

Several other www sites provide information on the water buffalo in various parts of the world.

The water buffalo homepage **<http://ww8.netnitco.net/users/djligda.waterbuf.htm>:** extensive information and other resources and links.

ABCB-Brazilian Buffalo Breeders Association **<http://www.openweb.com.br/bufalo>:** written in Portuguese.

Daher Ranch **<http://www.interconect.com.br/bufalo>** : in a Portuguese-English version, a very progressive water buffalo breeding farm.

Turkey Creek Buffalo **<http://www.cleaf.com/~tcwb/index.html>:** one of the largest US breeding farms.

Springhill farm **<http://teleport.com/~dodagift/buf/h20buf.htm>:** a US breeding farm.

Hungary has become a member of the Buffalo Network. Contact people:

1) Lazlo Karpati, Director, Ferto-Hansag Nemzeti Park Igazgatosaga, 9435 Sarrod Rev. Kocsagvar, 4, Hungary

2) Lazlo Megyery, Manager of Agriculture, Hortobagyi National Park Directorate, Sumen u. 2. Sz., 4024 Debrecen, Hungary

Azerbaijan has also joined the Network. Contact person is prof. Turan Turabov, Sofulu st. 247, 2a, apt. 30, Ganja City, 374703 Azerbaijan Republic.

FIFTH WORLD BUFFALO CONGRESS
Royal Palace, Caserta (Italy) 13-16 October, 1997

Organized by the International Buffalo Federation

Preliminary Scientific Programme

Monday, October 13
8.30 - 9.30 Registration
9.30 - 10.30 Opening ceremony
(W.R. Cockrill and G. De Francisci)
10.30 - 11.00 Coffee break
11.00 - 13.00 1st Plenary
Session: Buffalo production in different environments
Key lectures:
Buffalo milk and processing
(F. Addeo)
Milk production and quality in Asia
(N.C. Ganguli))
Meat production on grazing conditions
(P. Cleve do Bomfim)
13.00 - 14.00 Lunch break
14.30 - 15.30 Poster Session
15.30 - 18.00 Short communications (3 separated sessions):
1. Milk production and processing
2. Nutrition requirements and forage resources
3. Meat and draught
18.00 - 19.00 Discussion

Tuesday, October 14
9.00 - 11.00 2nd Plenary Session: Buffalo genetic improvement
Key lectures:
Impact of new breeding schemes on genetic progress
(T.H. Meuwissen)
Gene mapping of the Mediterranean buffalo
(L. Iannuzzi)
DNA polymorphisms in paternity exclusion
(D. Di Berardino)
11.00 - 11.30 Coffee break
11.30 - 12.30 3rd Plenary Session: Reproduction
Key lectures:
News on reproduction biotechnologies in males
(W. Vale)
News on reproduction biotechnologies in females
(L. Zicarelli)
12.30 - 14.30 Lunch break
14.30 - 17.00 Short communications (3 separated sessions):
1. Breeding schemes
2. Reproduction Technologies
3. Buffalo Genome
17.00 - 18.00 Discussion

Wednesday, October 15
9.00 - 11.00 4th Plenary Session: Social and economic aspects
Key lectures:
Prospects of buffalo production in Asia
(L. Cruz)
Prospects of buffalo production in South America
(J. Ruggeri)
Prospects of buffalo production in Europe
(F. De Stefano)
11.00 - 11.30 Coffee break
11.30 - 12.30 Poster session
12.30 - 14.30 Lunch break
14.30 - 16.00 Short communications (3 separated sessions):
1. Management of calf weaning and newborn pathology

FIFTH WORLD BUFFALO CONGRESS

2. Physiology and diseases
3. Processing hides and carcass by-product

16.00 - 17.00 Discussion

17.00 - 18.00 Presentation of the FAO Buffalo Research Network (Europe-Near East)
(G. Rossi)

Thursday, October 16

9.00 - 11.00 5th Plenary Session: Management and market
Key lectures:
Marketing of milk and dairy products in India
(Gupta A.)
Marketing of Mozzarella cheese
(F. Consalvo)
Management and marketing of products in small holdings
(O. Senchenko)

11.00 - 11.30 Coffee break

11.30 - 12.30 Closing session

15.00 - 19.00 Field trip (buffalo farm and Museum of ancient local history)

20.00 Social dinner

Post-conference tours (buffalo farms and tourism) will be organized on 17 and 18 October. ■

Proceedings

The lecture manuscripts (on request and maximum 8 pages), poster abstracts, and the short papers will be published in the Proceedings (available at the meeting).

Abstracts and short papers

Any topic concerning buffaloes is welcome. Abstracts (about 230 words) and short papers (4 pages written on one side of one sheet of white A4, 21 x 29,7 cm) must be in English and should include the title, authors' names, address for correspondence, and at least 3 key words. Send the abstracts and short papers to Congress secretary.

Deadline

The deadline for receiving abstracts and short papers is May 30, 1997.

Notification of acceptance together with instructions for preparation of definitive short paper will be sent to the first author. The deadline for receiving the definitive short papers is May 30th, 1997. At least one author must register for the Congress and attend the Poster Session. Posters may not be presented and appear in the programme unless the author

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"Buffalo Newsletter"
Istituto Sperimentale per la Zootecnia
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00016 Monterotondo, Italy

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www.inea.it/ISZ/newnet.htm

Number 7 - June 1997

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June 18, 1997

has completed the official registration form and provided a registration fee.
Official language: English.
Simultaneous translation service from English into Italian and Portuguese will be provided.

REGISTRATION FEES

Participant:
before March 31th, 1997: $ 300
after March 31 th, 1997: $ 350
Accompanying Person: $ 150
Student: $ 100
Visit and touristic trips are not included.
Send registration form to the following address:

APA - Associazione Provinciale Allevatori Via C. Battisti, 56
81100 Caserta, Italy
Tel. (+39) 823-356670
Fax (+39) 823-355564

ACCOMODATION

Hotel informations will be provided in final announcement.

REGISTRATION FORM

Please type or print in block letters and send the completed form to the APA - Associazione Provinciale Allevatori and retain a copy for your records.

PERSONAL INFORMATION

1. Participant:

Family name (Mr./Mrs./Ms.) .....
First name ..... Middle name .....
Participation (Active/Listener) .....
Discipline (Genetic/Nutrition/Production systems) .....
Article Title .....
.....
Presentation (Lecture/Poster) .....
Nationality ..... Passport N° .....
Organization .....
Position .....
Address .....
Telephone ..... Fax ..... Telex .....

2. Accompanying person(s):

Family name (Mr./Mrs./Ms.) First name .....
Family name (Mr./Mrs./Ms.) First name .....

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