

# Buffalo Newsletter



Number 5 - September 1996

EUROPE - NEAR EAST

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

## From the editor:

**A**FTER three years of involvement as the coordinator of the FAO Inter Regional Buffalo Research Network, I am regretfully leaving this position, as well as the direction of the Animal Production Research Institute, which is the co-ordination centre of the Network. I have gone back to the University of Molise where I am a lecturer in Animal Breeding.

**I** FEEL regretful, as everybody feels when a performed activity is over. In this case I think of buffaloes and their world. Buffalo is a humble, quiet animal, very tolerant to the hard conditions in which it lives, and very generous in giving the human kind its irreplaceable contribution. The "buffalo world", i.e. farmers first, technicians, researchers, all people responsible for development projects have the same virtues as buffaloes: they are humble, generous and always available to co-operation. Therefore I also regret that I will not get in touch with these people as often as in the past.

**D**URING the past three years, the Buffalo Network has

developed some of the activities for which it was constituted: its main objective is in fact to create and maintain links between researchers and technicians working in the Mediterranean area, in order to put in common the different experiences and be stimulated for new ideas and projects. Three Symposia were organized by the Network: 1. "Buffalo Products" in Italy, in 1994; 2. "Buffalo Reproduction" in Bulgaria in 1995; and 3. "Buffalo Resources" in Egypt, in 1996. Researchers and technicians of over ten countries took part to them. The Network has also co-operated to the constitution of a Working Group on Buffalo Milk Recording within the International Committee for Animal Recording, and a draft of common regulations for milk recording in buffaloes was already prepared. Finally, five issues of the bulletin "Buffalo Newsletter", of which I am the Editor, have been published. Over one thousand copies of each issue are distributed all over the world, and not only in the countries of the Network (Europe-Near East). They are sent to researchers, farmers, any people interested in

buffalo production, governments, non-governmental organizations, libraries.

A.M. FILLA  
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## MILK PERFORMANCE RECORDING IN BUFFALOES

B. Moioli

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The International Committee for Animal Recording (ICAR)\* is an international non governmental organization. The purpose of ICAR is to facilitate the extension and standardization of methods of recording animals. Special regulations for recording are already in force for cattle (milk and beef), sheep and goats. ICAR organizes an international conference every second year which is attended by people of the member countries, which are at present forty. Any country can apply for becoming member of ICAR by adopting and satisfying the International Agreement of recording practices. From 23 to 28 June 1996 the 30<sup>th</sup> ICAR session took place at Veldhoven (The Netherlands). During this conference, a Working Group on Buffalo Recording was officially created. The group included people of both research organizations and milk recording organizat-

ions of the following countries: India, Pakistan, Egypt, Italy and Bulgaria. The group has met several times and has prepared a draft for an International Agreement for the recording of milk performances in buffaloes which was submitted to the Board of ICAR for approval and is presented at page 6 of the present issue of the Newsletter.

Within the ICAR conference a session was devoted to buffalo recording. At the session, chaired by Salah Galal (FAO, Rome), four communications were presented. Bianca Moioli (Italy) has presented the results of the survey on buffalo recording in the world. Eighteen countries are interested in this activity. India, with 40 million adult female buffaloes and Pakistan, with over 10 million, have the majority of dairy buffaloes in the world. Nepal and Egypt follow with

over 1 million. Myanmar and Sri Lanka have over half million female dairy buffaloes but did not answer the present survey. Bangladesh, Turkey and Iraq have over 100,000, Italy 75,000 while Bulgaria and Syria a few thousands. In Brazil and Venezuela dairy buffaloes are reared, but no answer was received from these countries. Swamp buffaloes were not considered because the purpose of the survey was to enquire in milk recording systems. A regular activity of milk recording is implemented in India (11,300 buffaloes recorded yearly in the State of Gujarat), Pakistan (3,000), Egypt (16,000), Italy (20,000) and Bulgaria (1,000). In other Indian federal states buffalo recording is carried on but no results were available to the present survey. In Bangladesh, Nepal, Iraq, Turkey and

FOLLOWS 

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### FROM PAGE 1

WE HAVE tried through the Newsletter to spread out all news relevant to buffaloes - coming events, proceedings, special projects - but also to refer the results of some researches in a simple and easy to understand way. We are also trying to describe the present state of buffalo farming in each of

the countries of the Network.

I HAVE to thank all people who have given a contribution to the Buffalo Newsletter, in particular the assistant editor, B. Moioli. Many thanks to FAO officers, J. Boyazoghlu, D. Chupin and S. Galal who have immensely helped the Network with suggestions

and financial support, and to the other members of the coordination board: L. Kanohev, D. Matasino and F. El-Kerabi.

I AM sure that the Buffalo Network will develop future important activities, and I wish to everybody a successful work.

A.M. PILLA



☞ Syria milk recording is done only in one or a few research herds. The recording activity is organized privately in Gujarat (India) by a cooperative of producers. It is structured at national level - therefore funds are provided by the government - in Pakistan, Egypt, Italy, Bulgaria and Nepal. The activity of recording is performed by appointed technicians or by the researchers themselves. Herd size is the main problem in the organization of the activity. Everywhere herds are composed of 1 to maximum 5 animals, except Italy and Syria (50 to 100 animals). There are a few big herds in Egypt, Bulgaria and Pakistan (State or research herds). Problems arising from small herd size concern the waste of time for the recording staff visiting the farm and the difficulty in separating the calf from the dam.

The following basic rules for milk recording are similar in every country:

1. all buffaloes of the herd must be recorded;
2. milk is recorded once a month;
3. lactation yield is calculated by summing the average yield

of two consecutive tests multiplied by the number of days between tests;

4. lactation duration is 270 to 310 days.

The following basic rules for milk recording differ from one country to another:

1. maximum number of days allowed for first test after calving: from 6 to 75;
2. suckling of the calf: forbidden in some countries, ignored in others;
3. expression of milk yield: litres or kg.

Regular sampling for analysis of butterfat is done in India, Pakistan, Italy, Bulgaria and Turkey; for protein only in Italy and Bulgaria.

In all countries, the information collected at each monthly test are given back to the farmer at the following test: calving date, age and type, sex of calf, sire used. Data processing and sheet printing is computerized in India, Pakistan, Egypt, Italy, Bulgaria and Nepal. A lactation certificate is produced and required for the sale of breeding animals only in Italy and Bulgaria. Data collected through milk recording are used for selection in India,

Pakistan, Italy, Egypt, Bulgaria and Nepal.

**A.S. Abdel Aziz (Egypt)** has referred on the comparison between the use of monthly-test-date method (AD) for milk recording in Egyptian buffaloes, and the tedious daily recording (ED) used in the past. The study involved 2,297 milk records of 614 buffaloes, sired by 80 sires. Overall means of actual and estimated milk yield were almost equal (1,394 vs. 1,395 kg). The correlation coefficient between AD and ED was 0.98, ( $P < 0.01$ ). Estimates of heritability calculated from both AD and ED of the first lactation were very close ( $0.48 \pm 0.19$  and  $0.47 \pm 0.19$ ). The use of all lactation records yielded lower  $h^2$  values:  $0.27 \pm 0.12$  and  $0.28 \pm 0.12$ . The same estimate of repeatability of  $0.26 \pm 0.068$  was obtained for AD and ED records. The records were also used in estimating breeding values of the bulls. Using all lactations, breeding values ranged from -577 to +481 kg for AD and from -591 to +483 kg for ED. The accuracy of estimation ranged from 0.13 to 0.89. Ranking bulls according to their breeding value for all lactations of AD and ED, 46% of them had the same ranking.

**Rafiq Usmani (Pakistan)** has referred on the factors limiting regular recording of lactation performance of dairy buffaloes in Pakistan. Although buffaloes are the primary dairy animals in this country, contributing to more than 71% of the national milk production, milk recording is inadequate. Only 3,000 buffaloes are scientifically recorded. Group or herd records (based on the word of the owner) are kept for approximately 300,000

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buffaloes by various milk processing agencies. Unwritten records of about 180,000 buffaloes are available with peri-urban commercial dairy buffalo herds: in fact they do not keep buffaloes unless their daily milk yield is greater than 10 litres. However, for the 90% remaining buffalo population, owned by small farmers, no records are kept, for the following reasons: buffaloes in small farms are underfed because the majority of the farmers do not own any land and milk production is low; moreover, milk is very much self consumed, and only 25% is sold through a long chain of middle men: farmers income is therefore very low and they are discouraged to keep records of milk yield. Literacy rate in rural areas is 28%, for which the majority of farmers cannot keep written records. Finally the lack of awareness of the importance of records, as well as the lack of incentives by the government does not allow to implement the recording activity.

**T**zonka Peeva (Bulgaria) referred on the future improvement of buffalo in Bulgaria. The first breeding society was created in 1935. After 1944 big cooperative state farms were created (100 to 500 buffaloes). In these farms buffaloes were milk recorded and in the sixties machine milking was introduced. Animal breeding centres were established in all districts, collecting the milk recording data and sending them to the National Centre for Selection and Reproduction in Animal Breeding. The big changes which took place in Bulgaria in the last years with the elimination of cooperatives caused a reduction by 40-50% in the number of all animals, and also buffaloes. There are now about 7,000 female buffa-



Milk recorded buffalo RMS68 Tor mancina farm. 2nd lactation, 270 days, 2,500 kg milk, 7.8 % fat, 5.4% protein.

loes, but only 805 are milk recorded. In the small private herds it is in fact hard to keep records.

**W**ithin ICAR, a Development Fund Task Force was created in 1995, with the aim of making developing countries benefit from what ICAR offers. The Task Force had his own session before the 30th ICAR Conference. Representatives from Bulgaria, Estonia, India, Pakistan, Tunisia, Zimbabwe and Latvia referred about milk recording experiences in their countries. In particular, Kamlesh Trivedi (India) referred on the Milk Recording and Genetic Evaluation of Cattle and Buffaloes in India, evidencing that the responsibility for the development of the dairy sector lies with the state government (there are 25 states and 7 unions territories). The central government formulates broad national policy guidelines providing planning and research support. There is no national milk recording or animal selection scheme. Four major institutions in the country have carried out animal improve-

ment programmes, with no coordination among each other's: National Dairy Development board, Kerala Livestock Development Board, Baratiya Agro-industries Foundation and Punjab Agricultural University. There is an urgent need to evolve cooperation among the institutions engaged in milk recording. In 1987, the National Dairy Development Board has implemented a programme for milk recording and genetic evaluation of buffaloes in several districts of Gujarat and Tamil Nadu, starting in selected milk sheds where the infrastructures for artificial insemination were well established. The main component of this programme is the progeny testing of bulls. A set of 20 bulls are put to test every year in each district. To generate 100 complete first lactation records of progeny per bull, some 2,000 doses of frozen semen of each bull are distributed in the selected villages. Results are now available for 58 buffalo bulls after first lactation yields of about 2,000 of their daughters.

**B. Mololi**

## PROPOSAL OF INTERNATIONAL AGREEMENT FOR THE RECORDING OF MILK PERFORMANCES IN BUFFALOES

Prepared by the Working Group on Buffalo Recording after the first series of meetings in Veldhoven, from 24 to 26 June, 1996

Participants: B.Moioli (Italy), S.Galal (FAO, Rome), K.Trivedi (India), R.Usmani (Pakistan), A.Abdel Azis (Egypt), F.El-Kerabi (Egypt), R.Donald (Egypt), Tz. Peeva (Bulgaria), A.Rosati (Italy), F.Miglior (Italy)

**1.** Milk recording in buffaloes concerns:

- milk yield produced in the lactation;
- fat content (optional);
- protein content (optional).

### **2.** General rules

**2.1** Milk recording has to be carried out during the whole lactation;

**2.2** standard lactation duration is established in 305 days (this figure is provisional until the participating countries carry out a survey in order to define the actual duration of the lactation in the different countries). The duration of total lactation has also to be indicated;

**2.3** milk recording has to be carried out on all the buffaloes of the herd;

**2.4** lactation starts the day immediately after calving;

**2.5** the first test day cannot be effected before the 7<sup>th</sup> day after calving;

**2.6** buffaloes can be eligible for milk recording under the following three milking systems:

- a) total milking;
- b) suckling for milk let down;
- c) partial suckling. In the case of b) and c), individual milk records should be marked accordingly.

**2.7** interval between two

tests should be either 28-32 days (A4 method) or 38-46 days (A6 method). The method should be chosen by the farmer and must cover all buffaloes for the whole lactation. The method must also be stated in the documents in which the lactation records are reported; only one test can be excluded on the account of abnormal reasons;

**2.8** each test must be effected on all milkings in the 24 hours, registering the time of the day (hours) and the amount of milk;

**2.9** milk yield can be expressed in kg or in litres;

**2.10** milk is weighed on scales with sensitivity of at least 250 grams or volumetrically with calibrated measures;

**2.11** in case fat and/or protein contents are measured, samples should be taken from all the buffaloes of the herd for the whole lactation. Samples may be taken by any of the following methods:

- a) a sample for each milking;
- b) a proportional composite sample for all milkings within the 24 hours test period;
- c) alternate (i.e. a.m./p.m.) samples on consecutive sampling days;

**2.12** methods for the analysis of milk components are the official ones approved by ICAR for cattle;

**2.13** lactation yield is calculated using the Fleischmann method;

**2.14** total fat and protein yields (kg) are calculated in the same way as lactation yield;

**2.15** average fat or protein percentages for the whole lactation are calculated by dividing total fat or protein yields (kg) x 100 by the total milk yield (kg).

## Buffalo Newsletter

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Editor

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Assistant Editor

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## RESEARCH PROJECT ON THE ENDOCRINE ACTIVITY AND REGULATION IN RUMINANS

Researchers of the Kielanowski Institute (Poland) with the cooperation of the Institute of Biology and Immunology of Reproduction (Bulgaria) and the Buffalo Research Institute (Bulgaria) have developed a common research project concerning the endocrine activity and regulation in buffaloes.

The gonadotropin releasing hormone (GnRH) is a major central factor involved in the regulation (synthesis and release) of the gonadotropin hormones (LH and FSH) and in sexual behaviour. The recognition of the neuronal structures synthesizing and releasing this hormone should therefore be

very important for optimising reproduction in this species.

The following preliminary results concerning male buffalo were presented at the international symposium on buffalo reproduction (Sofia, October 1995).

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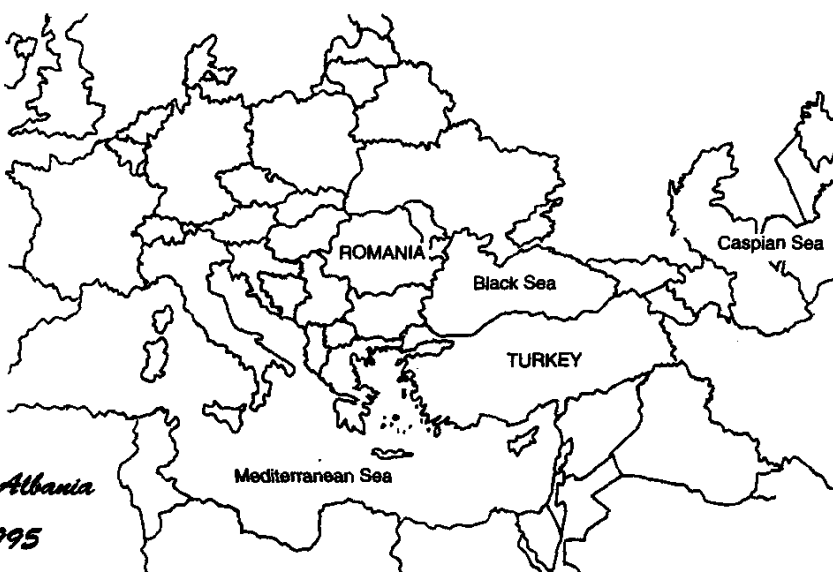
### GnRH NEURONAL SYSTEM IN THE FOREBRAIN OF MALE BUFFALO (BUBALUS BUBALIS)

by J. Polkowska<sup>1</sup>, M. Snochowski<sup>1</sup>, L. Kanchev<sup>2</sup>, J. Baichev<sup>3</sup>, A. Danev<sup>3</sup>

<sup>1</sup>The Kielanowski Institute of Animal Physiology and Nutrition, Jablonna, Poland, <sup>2</sup>Institute of Biology and Immunology of Reproduction, Bulgaria, <sup>3</sup>Buffalo Research Institute, Shumen, Bulgaria

In the present study we have examined the GnRH active structures of the forebrain of immature male buffalo (*Bubalus bubalis*). The immunocytochemically processed cryostat sections of the brain were evaluated using light microscope. The dense network of immunoreactive (ir) GnRH neurons were well organized from the septal to the premamillary areas of the forebrain. The majority of GnRH perikarya were found in two centers. The first was localized in the medial and lateral preoptic area adjacent to the organum vasculosum of the lamina terminalis, and the second represented the distinct population in the nucleus arcuatus close to the recessus infundibularis. The cells from area preoptica formed a continuum rostrally with ir neurons in the diagonal band of Broca, septum, stria medullaris thalami and stria terminalis. The majority of GnRH neurons projected caudally along the third ventricle through the anterior hypothalamic area and medial basal hypothalamus to the tubero-infundibular sulcus and external layer of the median eminence. The result obtained above seems to be representative for buffalo and may differ quantitatively at different physiological or environmental conditions.

*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, July 1995; Bulgaria and Albania in n. 4, December 1995*



**BUFFALO POPULATION AND PRODUCTION IN TURKEY**

**1 - ORIGIN:**  
Not clear.

**2 - GEOGRAPHICAL AREAS:**  
Coast of North Anatolia Region, north parts of Middle Anatolia and Thrace, also in Mus, Diyarbakir, Afyon and Sivas Provinces.

**3 - NUMBER:**  
TOTAL: 316,000  
ADULT: 224,470  
YOUNG STOCK: 91,530

**4 - HERD SIZE:**  
DAIRY HERDS: 1-15 buffaloes  
FATTENING HERDS: 50-200 buf.

**5 - DESCRIPTION:**  
(see table 1)

**6 - PRODUCTIVITY:**  
N. DAYS LACTATION/YEAR:  
**200-250.**  
LACTATION MILK YIELD (KG):  
**600-700 (in the field).**  
**900-1000 Afyon Buffalo Research Inst.**  
AGE AT FIRST CALVING (MONTHS):  
**36.**  
AVERAGE LACTATION NUMBER:  
**5.**  
AGE AT SLAUGHTER FOR YOUNG STOCK:  
**12 - 18 months.**  
WEIGHT AT SLAUGHTER (KG):  
**180-250.**  
- IS THE CALF SUCKLING? **Yes.**  
- HOW MANY MONTH? **3-4.**  
- IN ALL HERDS ? **Yes.**  
- ARE COWS MILKED ONCE A DAY?

**At end lactation.**  
- ARE COWS MILKED TWICE A DAY?  
**At the beginning of lactation for 2-3 months.**  
(Only Afyon Buffalo Research Institute along the whole lactation)  
- WHERE?  
**Every where.**  
- ARE COWS MILKED BY HAND?  
**Yes.**  
- ARE COWS MACHINE MILKED?  
**Only at the Afyon Buffalo Research Institute.**

**7 - FERTILITY:**  
N. CALVES/YEAR: **1/2, 2/3**  
SEASON OF CALVING: **Every season except winter.**

**8 - HOUSING:**  
In dairy units: in classical barns as tied.

**9 - ARE BUFFALOES USED FOR DRAUGHT?** Yes, in the mountain region.

**10 - SOURCE OF FEEDING:**  
In the farms:  
- in summer: mostly grazing

Table 1. Some Descriptive Characteristics in Adult Buffaloes

|                             |                                  |
|-----------------------------|----------------------------------|
| HEIGHT AT WITHERS (CM)..... | 130                              |
| LIVE WEIGHT (KG).....       | 410                              |
| COLOR.....                  | BLACK                            |
| HORNS.....                  | SINGLE SHAPE EXTENDING BACKWARDS |

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on natural grassland and a little wheat bran when at milking.

- in winter: stem of maize or soybean and a little wheat bran and concentrate mixture;
- In the fattening units: wheat bran, concentrate mixture, barley, sunflower and sugar beat pulps and straw of corn or rice.

**11 - TOTAL ANNUAL PRODUCTION BY SPECIES.**

(see table 2)

OTHER PRODUCTS FROM BUFFALO:  
**Leather.**

**12 - MILK RECORDING:**

Only at the Afyon Buffalo Research Institute.

**13 - REPRODUCTION:**

HAS EACH FARMER HIS OWN BULL?

**No.**

ARE THERE BULLS FOR NATURAL SERVICE AVAILABLE IN VILLAGES?

**Yes.**

HOW MANY? **In enough number.**

ARTIFICIAL INSEMINATION:

**No.**

**14 - DISEASES:**

Parasites, viral diarrhoea, foot and mouth disease.

**15 - SOCIAL POSITION OF BUFFALO FARMERS.**

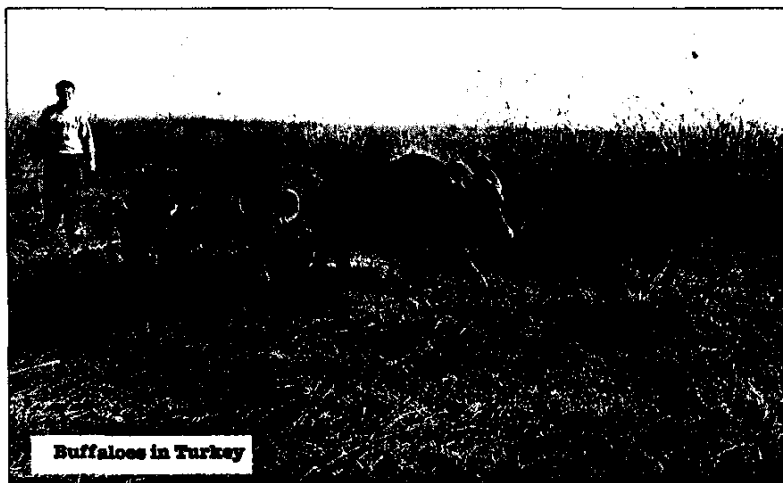
For dairy buffalo farmer, buffalo keeping is secondary occupation. Buffalo farming for fattening is generally the main occupation. Income from buffalo farming is quite good.

**16 - PERSPECTIVES OF BUFFALO PRODUCTION:**

In Turkey, during the last 30 years the number of buffaloes decreased significantly. Main reason of the decrease is political for the lack of guidelines for animal husbandry in the agricultural economy of Turkey. Nevertheless buffalo husbandry is still important in small family units as resource of various products. In Turkey the main regions where buffalo is raised are the coast and inside of North Anatolia region, having these regions the most suitable environmental conditions for buffalo farming. Also in Mus, Diyarbakir, Afyon and Sivas Provinces buffalo is raised. Afyon Buffalo research Institute is the only establishment where buffalo is raised under controlled conditions. In the country, buffalo is raised for its milk in small family units. In the units male calves are sold for fattening or draught. Female animals are slaughtered at the end of their productive life. But, in

recent years in the north of Turkey (in Bafra, Vezirköprü, Carsamba Districts of Samsun Provinces; Turhal District of Tokat Province; Suhuova District of Amasya Province) fattening is done in big units (50, 100, 200 heads) extensively, especially with young male animals. In buffalo fattening, main problem is marketing; in Turkey buffalo meat is only used in meat products like sausage. People do not accustom to eat buffalo meat in their meals. Therefore, at the end of the fattening period, buffaloes can be marketed to 2 sausage factories in Istanbul Province, except some local markets in Vezirköprü District of Samsun province and Turhal District of Tokat Province. This situation prevents competition as regards to meat price, although the prices of concentrate mixture are getting higher.

**Prof. Dr. Osel Sekarden**  
Buffalo Network National co-ordinator  
Ziraat Fakültesi Samsun (Turkey)



Buffaloes in Turkey

Table 2. Annual Production of Various Species (1983)

|                | N. OF MILKED FEMALES | TOTAL MILK PRODUCTION (TON) | N. OF SLAUGHTERED ANIMAL | MEAT PRODUCTION (TON) |
|----------------|----------------------|-----------------------------|--------------------------|-----------------------|
| <b>BUFFALO</b> | <b>147.980</b>       | <b>140.370</b>              | <b>50.300</b>            | <b>7.125</b>          |
| <b>COW</b>     | <b>6.031.950</b>     | <b>8.904.350</b>            | <b>2.085.350</b>         | <b>295.995</b>        |
| <b>SHEEP</b>   | <b>21.531.820</b>    | <b>1.047.325</b>            | <b>6.868.530</b>         | <b>112.800</b>        |
| <b>GOAT</b>    | <b>5.463.880</b>     | <b>513.975</b>              | <b>959.260</b>           | <b>16.135</b>         |



## BUFFALO POPULATION AND PRODUCTION IN ROMANIA

### 1 - ORIGIN:

Common European water buffalo.

#### - TYPES:

Mediterranean.

#### - BREEDS:

Romanian Buffalo.

#### - CROSSING:

Romanian Buffalo breed is sometimes crossed with Murrah breed.

### 2 - GEOGRAPHICAL AREAS:

See fig. 1.

### 3 - NUMBER:

TOTAL: 209,432

ADULT FEMALES: 97,320

ADULT MALES: 2,510

YOUNG STOCK: 109,602

The number is steady, with a lower increasing (31.12.1995).

### 4 - HERD SIZE:

NUMBER HERDS: 86,480

- PRIVATE HERDS: 86,471

N. ADULTS: 95,544

N. YOUNG: 106,171

- RESEARCH HERDS: 1

N. ADULTS: 155

N. YOUNG: 307

- INDUSTRIAL HERDS: 8

N. ADULTS: 1,621

N. YOUNG: 3,124

### 5 - DESCRIPTION:

(see table 3)

### 6 - PRODUCTIVITY:

Milk yield varies according to season of calving, lactation number, level of feeding, length of lactation.

N. DAYS LACTATION:

**252-285 days.**

LACTATION MILK YIELD (KG):

**958-1455.**

Fig. 1.



Legend

- AA** 5,000 to 20,000 buffaloes
- A** less than 5,000

AGE AT FIRST CALVING (MONTHS): **38-42.**

AVERAGE LACTATION NUMBER: **6-9.**

AGE AT SLAUGHTER FOR YOUNG STOCK: in general, males are slaughtered at 22-24 months and 350-400 kg or at 3-4 months of age and 80-100 kg in private farms or in specialised fattening centres. The females are slaughtered after the first lactation or after the end of production life at 500-600 kg.

- IS THE CALF SUCKLING? Generally calves suckle 2-3 months in private and industrial farms. Breeding calves are weaned at 120

days, when able to eat 1.5-2 kg of hay, 1.5-2 kg concentrates and 4-5 kg silage.

- ARE BUFFALOES MILKED ONCE A DAY? **No.**

- ARE BUFFALOES MILKED TWICE A DAY? In all farms buffaloes are milked twice a day, in the morning and in the evening.

- ARE THEY MILKED BY HAND? **Yes, in the private farms.**

- ARE THEY MACHINE MILKED? **Yes, in research and industrial farms.**

### 7 - FERTILITY:

N. CALVES/YEAR: **0.68-0.85**

SEASON OF CALVING: **spring-summer.**

### 8 - HOUSING:

Shelters are linearly disposed with four or three sides, one or two shapes, with or without manger and are used during unfavorable weather conditions.

Table 3.

|                     | ADULT MALE | ADULT FEMALE |
|---------------------|------------|--------------|
| - HEIGHT AT WITHERS | 140 - 142  | 131 - 133    |
| - WEIGHT            | 650 - 680  | 530 - 560    |

The colour is black with some brown or greyish nuances. In rare cases white spots on fore - head and also legs and tail extremities.

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**Table 4. Total animal production by species (1994)**

|                        | NUMBER ADULT FEMALES | TOTAL MILK*   | CONSUMED FRESH* | CHEESE***     | FERM. MILK YOGH* | BUTTER AND GHEE** | OTHER DAIRY* | MEAT**     |
|------------------------|----------------------|---------------|-----------------|---------------|------------------|-------------------|--------------|------------|
| <b>TOTAL</b>           | -                    | <b>47,347</b> | <b>27,810</b>   | <b>12,063</b> | <b>2,714</b>     | <b>3,660</b>      | -            | <b>588</b> |
| <b>BUFFALO</b>         | <b>97,320</b>        | <b>1,168</b>  | <b>310</b>      | <b>858</b>    | -                | -                 | -            | <b>32</b>  |
| <b>COW</b>             | <b>1,881,680</b>     | <b>42,339</b> | <b>27,500</b>   | <b>7,365</b>  | <b>2,714</b>     | <b>3,660</b>      | <b>1,000</b> | <b>389</b> |
| <b>SHEEP AND GOATS</b> | <b>8,993,000</b>     | <b>3,840</b>  | -               | <b>3,840</b>  | -                | -                 | -            | <b>167</b> |

\* thousands hectolitres      \*\* thousands tons      \*\*\* tons

**Table 5. Livestock per 100 hectares of land\* (heads) (at the beginning of the year 1996)**

|                                      | TOTAL FARMS | PRIVATE FARMS |
|--------------------------------------|-------------|---------------|
| <b>TOTAL BOVINE</b>                  | <b>25.5</b> | <b>27.8</b>   |
| <b>COW AND BUFFALO ADULT FEMALES</b> | <b>14.0</b> | <b>16.4</b>   |
| <b>TOTAL SHEEP + GOAT</b>            | <b>86.9</b> | <b>100.5</b>  |
| <b>SHEEP AND GOAT ADULT FEMALES</b>  | <b>63.2</b> | <b>74.1</b>   |

\* The livestock of cattle, sheep and goats are related to the arable land + pasture + meadows. The leather are used (after processing) for various products: shoes, luggage, belts, etc

ions. No matter of season a semiintensive maintenance is used with closed barns, tied in winter and a combination with grazing in warm seasons. The young buffaloes are kept for grazing period on pasture.

**9 - ARE BUFFALOES USED FOR DRAUGHT?**

Dual-purpose type of buffalo is used for draft in small private farms: plowing the land, transportation of crops, wood, manure, roughages, etc. For draft buffaloes are used at 3 years of age both males and females but females are preferred.

**10 - SOURCE OF FEEDING:**

- Spring: leguminous, graminous and natural hay;
- Winter: concentrate mixture, wheat bran (private farms) and silo (industrial

and research farms);  
Summer/Autumn: graze and concentrate mixture or wheat bran.

**11 - TOTAL ANNUAL PRODUCTION BY SPECIES (1994).**

(see table 4/5)

**12 - MILK RECORDING:**

Milk recording is based on official control performed by specialised district staff in farms. Periodic official control in farms is performed at 28 days interval, beginning the 5<sup>th</sup> day from calving. In private farms a so called "diversified control" (one milking or 2-3 controles per lactation).

**13 - REPRODUCTION:**

HAS EACH FARMER HIS OWN BULL?

**In research and industrial farms only.**

ARE THERE BULLS FOR NATURAL SERVICE AVAILABLE IN VILLAGES? 2-4.

HOW MANY? In between villages or communities a rotation of sires every 3 years is practiced.

**ARTIFICIAL INSEMINATION:**

In research farm only (about 100 buffalo cows inseminated/year).

**14 - DISEASES:**

Enteropulmonare viral disease on calves 0-3 month of age. Tuberculosis appears rarely.

**15 - SOCIAL POSITION OF BUFFALO FARMERS.**

The social position of buffalo farmers is good, with average living standard.

**16 - PERSPECTIVES OF BUFFALO PRODUCTION:**

We want to create a dual-purpose type (milk and meat) having 134-136 cm height, over 600 kg body weight as adult, milk production over 1600 kg milk and 120 kg fat, age at freshening under 36-37 months and 600-800 g daily gain.

Eng. I. Popovici

**TRANSFERRIN TYPES OF BLOOD SERUM AND GENETIC STRUCTURE OF BUFFALO POPULATION OF SAMSUN PROVINCE FOR TRANSFERRIN TYPES**

Ö.Sekerden<sup>1</sup>, F.Dogrul<sup>2</sup> and H.Erdem<sup>1</sup>

<sup>1</sup> Dept. of Anim. Sci. Fac. of Agriculture, Univ. of Ondokuz, Mayıs, Samsun, Turkey.

<sup>2</sup> Etlik Veterinary Research Institute, Ankara, Turkey.

In this research, the distribution of transferrin types of 115 male and 119 female buffaloes raised in Kavak, Vezirköprü and Carsamba Districts of Samsun Province were determined.

Buffalo population of Samsun Province includes 11% and 29% of Turkey and Black Sea Region buffalo populations respectively. The number of buffaloes of Black Sea and Samsun Province are shown in Table 6 and table 7 respectively.

Blood samples were taken from 115 male and 119 female buffaloes aged 1 to 18 months. These animals are raised in 106 herds in 13 villages in Carsamba, Kavak, Vezirköprü Districts of Samsun Province (Table 8).

**Results**

The following genotype frequencies were found:

Table 6. Number of buffalo in Black Sea Region (anonymous, 1994)

| PROVINCE     | NUMBER OF BUFFALO |
|--------------|-------------------|
| SINOP        | 10,803            |
| TRABZON      | 5,891             |
| ARTVIN       | 125               |
| SAMSUN       | 39,319            |
| KASTAMONU    | 14,796            |
| ORDU         | 5,715             |
| CORUM        | 14,165            |
| ZONGULDAK    | 6,685             |
| GÜMÜRHANE    | 2,166             |
| GİRSEUN      | 5,663             |
| BARTIN       | 2,941             |
| RIZE         | -                 |
| AMASYA       | 14,787            |
| TOKAT        | 36,576            |
| <b>TOTAL</b> | <b>157,698</b>    |

Table 7. Number of buffaloes in Samsun (anonymous, 1994)

| DISTRICT     | NUMBER        | RATE (%) |
|--------------|---------------|----------|
| MERKEZ       | 985           | 2.5      |
| ALAGAM       | 5,124         | 8.1      |
| ASARCIC      | 1,223         | 4.6      |
| ATVAÇIK      | 720           | 1.8      |
| BAPRA        | 6,265         | 15.9     |
| CARSAMBA     | 5,958         | 10.0     |
| HAYRA        | 5,450         | 8.3      |
| KAVAK        | 7,300         | 19.8     |
| LADIK        | 800           | 2.0      |
| 19 MAYIS     | 525           | 1.3      |
| SALIPAZARI   | 117           | 0.3      |
| TREKKEKÖY    | 118           | 0.3      |
| TIRNA        | 1,445         | 3.7      |
| VEZIRKÖPRÜ   | 7,495         | 19.1     |
| YAKAKENT     | 651           | 1.6      |
| <b>TOTAL</b> | <b>39,319</b> |          |

Transferrin DD= 68.8%  
 Transferrin AD= 24.8%  
 Transferrin AA= 6.0%  
 Transferrin DE= 0.427%

Transferrin D= 0.81%  
 Transferrin A= 0.18%  
 Transferrin E= 0.002%

The corresponding allele frequencies were:

It is concluded that the population is in balance according to Hardy Weinberg theory.

Table 8. The Number of Animals considered in the analysis.

| DISTRICT             | DATE BLOOD COLLECTION | VILLAGE     | N° OF HERDS | NUMBER OF ANIMALS |            |            |
|----------------------|-----------------------|-------------|-------------|-------------------|------------|------------|
|                      |                       |             |             | MALE              | FEMALE     | TOTAL      |
| Carsamba             | 04.04.95              | Durakbaşı   | 2           | 6                 | 2          | 8          |
|                      |                       | Sefali      | 9           | 17                | 16         | 33         |
|                      | 05.04.95              | Çayvarlı    | 7           | 12                | 5          | 17         |
|                      |                       | Bayramlı    | 15          | 11                | 15         | 24         |
|                      |                       | Demircilli  | 5           | 6                 | 9          | 15         |
| <b>TOTAL</b>         |                       | <b>5</b>    | <b>24</b>   | <b>52</b>         | <b>45</b>  | <b>97</b>  |
| Kavak                | 06.04.95              | Civril      | 14          | 6                 | 11         | 17         |
|                      |                       | Duraköy     | 11          | 10                | 10         | 20         |
|                      |                       | Muratbeyli  | 8           | 5                 | 6          | 11         |
|                      |                       | Galbaşı     | 15          | 11                | 15         | 24         |
| <b>TOTAL</b>         |                       | <b>4</b>    | <b>48</b>   | <b>32</b>         | <b>40</b>  | <b>72</b>  |
| Vezirköprü           | 29.05.95              | Bayram Köyü | 5           | 7                 | 4          | 11         |
|                      |                       | Meseli      | 4           | 5                 | 8          | 13         |
|                      |                       | Adatepe     | 10          | 16                | 19         | 35         |
|                      |                       | Oymağac     | 4           | 5                 | 5          | 6          |
| <b>TOTAL</b>         |                       | <b>4</b>    | <b>25</b>   | <b>31</b>         | <b>34</b>  | <b>65</b>  |
| <b>GENERAL TOTAL</b> |                       | <b>13</b>   | <b>108</b>  | <b>115</b>        | <b>119</b> | <b>234</b> |

## CROSS-BREEDING AMONG BUFFALOES, STILL AN UNEXPLOITED NATURAL RESOURCE

B.R. Benjamin, retired Principal Scientist, India

**M**an must utilise all the possible resources for his survival in view of the global population explosion. Cross-breeding is one of the oldest methods for increasing the productivity, if adopted sensibly. The crossbreeding of domestic cattle without proper health cover and nutritional support leads to mongrelization, a senseless waste of both the precious germplasm assets and liabilities. The innate disease resistance, heat tolerance, cold tolerance and performance capabilities do differ with breeds performing under various environmental stresses.

As a premise it must be said that the world buffalo is used rather loosely and thus created considerable confusion. The north American buffalo is more similar to the Zebu (*indicus*) cattle with regard to the karyotype ( $2n=60$ ). The African buffaloes are *Syncerus Caffer nanus* (Congo buffalo,  $2n=54$ ) and *Syncerus Caffer caffer* (African buffalo,  $2n=52$ ). The Wild Indian buffaloes (bison) are still untamed and live mostly in the forests of Madhya Pradesh and Assam. The wild free living buffaloes are known as "Arni".

All these aforesaid buffaloes are not domesticated and consequently crossbreeding is almost impossible, although several experimental hybridization studies were undertaken in Canada on American Bison and taurine cattle. The experiment had to be discontinued due to hybrid male sterility.

The geographical division between the Riverine and the Swamp buffaloes is assumed to be Patkai, Barail and Arakan-Yoma mountain ranges of Burma. The buffaloes distributed to the West of these mountains are supposed to be River types

and those distributed to east of these mountains (far East) are believed to be Swamp types. All the descript and non-descript South Indian buffaloes, resemble Swamp buffaloes in external features, low milk yield and small body size. Even the karyotypes of Orissa buffaloes are similar to the 48 chromosomes of Swamp buffalo (Bidar et al., 1986). Therefore, the demarkation line between the distribution of river and Swamp breeds within India (north-south) is yet to be established by cytotaxonomists, based on the karyotypes. All the non-descript or descript north Indian buffaloes studied by me had 50 chromosomes of River type. (Chakrabarthy & Benjamin 1980).

The chromosomal aberrations (deletions) are more common in buffaloes wallowing or drinking water polluted with the Pesticide factory effluents. This may account for the sterility among the affected buffaloes.

The hypothesis that the genome (50 chromosomes) of River buffaloes is accommodated in the 48 chromosomes of the Swamp requires experimental verification, but fortunately, the River buffalo ( $2n=50$ ) and the Swamp buffalo ( $2n=48$ ) crosses are fertile despite the 49 chromosomes in F1 and F2 offspring. However, the River type (Murrah, Nili Ravi) males are usually reluctant to mate with the Swamp she-buffaloes, unless the two breeds are raised together from the calf-hood in the same environment. This sex-behavioral problem can be circumvented by inseminating the Swamp she-buffaloes artificially.

Riverine males (Murrah, Nili) are usually imported from India or Pakistan to the other South east Asian countries

such as Thailand, Philippines, Malaysia, Burma and Indonesia. The wall-eyed characteristic is considered to be the trade mark of the Nili Ravi breed. All their offspring have wall eyes. The tight-curlied horns are preferred in the River types (Murrah, Nili Ravi). White markings on the head (muzzle, forehead) feet (pasterns, fetlocks) and white tail switches are also considered as markers and breed characteristics of the three popular River types.

There is general improvement among crossbreds in all the productive traits (birth weight, age at maturity, age at first calving, reduced intercalving period, duration of heat, gestation) over the native swamp buffaloes, provided they are well fed and given adequate health care.

The milk and meat potentials improved in the crossbreds (River X Swamp) when the crossbreeding programmes were implemented in Malaysia and Philippine herds. The cross-breds need better feeding to express the gain in their production. Poor and marginal farmers lack motivation for more milk production, because of the high feed cost, being buffaloes for them triple-purpose animals: work, milk and meat. Meat is considered by-product after fully utilizing them for work (paddy cultivation) and incidentally for milk (2-3 litres/day).

Local people appeared to be satisfied with this small amount of milk usually produced by the Swamp buffaloes for domestic consumption and for rearing the suckling calf, irrespective of the sex. The crossbreed (Murrah X Swamp) needs to be well fed to yield more milk for sale. If the dairying is the main motivation, one should be able to invest more on the feed costs and management.

In view of the high overhead costs involved, Governmental organizations should come forward to launch well-designed cross-breeding programmes to reap the benefits and distribute the gains thus achieved to the public. The pilot studies on cross-breeding (by Govt) should be able to study the combining ability of the three productive traits (work-meat-milk) in the environmental background of the developing countries where the cross-breeds are meant to perform.

Charan Chantalakhana (1979) critically discussed the beneficial effects of crossbreeding of buffaloes in South East Asian Countries.

The demand of milk and meat from large parts of the world can be met by the formulation of cross-breeding guidelines. The scientific cross-breeding should not remain as an unexploited natural resource any longer or end up in a meaningless haphazard mixture of grades or breeds.

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**TWO EGYPTIAN RESEARCHERS ATTENDED A THREE MONTHS STUDY TOUR PROGRAMME IN ITALY FROM 4TH OF MARCH TO 4TH OF JUNE 1996**

**Dr. Reda Mohamed Khattab.**  
**Dr. Mohamed Mohamed Youssef.**  
 Animal Production Institute, Cairo.

**OBJECTIVES**

This program aims to follow up the advancement of the co operative joint project for improving the productive efficiency of Egyptian buffaloes in which the proposed planning matrix was discussed in the scientific workshop held in Cairo (June 1995). This study tour gives an opportunity for exchanging the experience with the Italian scientists and to initiate collaborative research lines e.g. to build up a strategy for buffalo nutrition based on recent scientific approach. Also, recognition of livestock farming systems in Italy and methods applied for genetic evaluation and breeding strategies is essential goal as well as overlook for biotechnology and research disciplines concerning milk and meat production from buffaloes.

**PROGRAMME SCHEDULE OF THE STUDY TOUR**

**A - Two months in the Animal**

Production Department - Udine University. The following activities had been achieved during this period:

**1 -** Follow up lab techniques of forage evaluation, methods of protein degradability determination and application of in situ studies.

**2 -** Presentation of two seminars concerning aspects of livestock production systems in Egypt and characteristics of buffalo production.

**3 -** Preparation of review article entitled: Prospects of buffalo production in relation to the agricultural production system in Egypt to be published in the Italian journal *Bubalus bubalis*.

**4 -** Revision and finalization of the planning matrix for the joint project.

**B -** Three weeks in Istituto Sperimentale per la Zootecnia - Monterotondo - Roma, Associazione Nazionale Allevatori Specie Bufalina - Caserta and faculty of veterinary medicine at University of Naples to fulfil the following items:

**1 -** Genetic evaluation of livestock production and recording system.

**2 -** Farming systems of sheep,

cattle and buffaloes.

**3 -** Characteristics of meat production.

**4 -** Production and reproductive aspects of Italian buffaloes.

**5 -** Research disciplines in Tor Mancina farm and labs.

**6 -** Milk collection, marketing and processing (Mozzarella production).

**7 -** Animal recording and application of artificial insemination.

**8 -** Impediments of buffalo reproduction (scientific discussions).



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**ACTIVITIES ON WATER BUFFALOES IN BANGLADESH**

by M.O. Faruque

**Complete research work:**

1. Project "Buffalo development programme in Bangladesh" sponsored by International Atomic Energy Agency and Bangladesh Agricultural University from 1981 to 1982.
2. Project "Genetic studies on the breed differentiation of native domestic animals (cattle, buffaloes, sheep, goat, pigs, horses and dogs) in Bangladesh" sponsored by Bangladesh Agricultural Research Council and Ministry of Education - Culture, Japan from 1983 to 1986.
3. Project "Studies on the performances of indigenous buffaloes in Mymensingh district" sponsored by University Grant Commission from 1988 to 1991.
4. Project "Buffalo development in Bangladesh - a pilot programme on development of intermediate technologies for selective breeding of village herd" sponsored by Science and Technology division, Ministry of Education from July 1991 to 1992.
5. Project "Buffalo breeding in Bangladesh - Part IB. Identification of breeds, strains and types of indigenous buffaloes in the coastal area of Bangladesh" sponsored by Bangladesh Agriculture University and Bangladesh Agricultural Research Council from July 1991 to June 1994.
6. Project "Evaluation of carcass of different genotypes (cattle, buffaloes, sheep and goats) of market animals in Bangladesh" sponsored by University Grant Commission

from July 1993 to June 1994.

**On going research work :**

1. Project "Buffalo breeding in Bangladesh - part 1C. Identification of breeds, strains and types of indigenous buffaloes in the marshy land and hilly area of Bangladesh" sponsored by Bangladesh Agricultural University, Mymensingh. Started from July, 1995 and will continue upto June, 1997.
2. Studies on the performances of exotic and crossbred buffaloes in farms and at farmers level. (Started from 1994 and will continue until the work is finished. At present sponsored by our department, but may involve finance from national and international source in future).

**CHARACTERIZATION, UTILIZATION AND CONSERVATION OF BUFFALOES AND BUFFALO GERMPLASM IN THE MEDITERRANEAN AREA**

*The Symposium "Mediterranean Animal Germplasm and Human Future Challenges" took place in Italy from 26<sup>th</sup> to 29<sup>th</sup> of November 1995, jointly organised by FAO, EAAP and CIHEAM.*

*Objective of the Symposium was to investigate into the role of autochthonous animal germplasm for a new vision of life on planet earth.*

*We would like to refer hereunder what has been mentioned about buffaloes, within a general communication on cattle, by E. Villa, from the Associazione Italiana Allevatori, Rome.*

Buffalo population raised in the Mediterranean Area represents about 2% of total world population. Nevertheless it is extremely interesting, representing a case of a buffalo population raised in close area: the Mediterranean, where all other livestock is present, being potentially competitive with it. At this regard, some preliminary considerations can be made, on the basis of the results of a survey carried out by an EAAP working Group (Nardone and Villa, 1993).

About 1,900,000 buffalo cows are raised, being mostly (75%) present in Egypt.

Milk represents the main production purpose, meat being the second one, draught the third one, only in 4 countries (Egypt, Turkey, Azerbaijan, Greece).

The range of variation of milk yield for buffaloes among the Mediterranean countries is restricted compared to cattle, varying according to a ratio of 1 to 2 (950 vs 1800) instead of 1 to 10.

Variability concerning morphological traits also appear lower, compared to what is indicated for cattle in the same area.

Number of buffaloes is declining for all the mediterranean countries, with the only exception of Egypt (stable) and Italy (increasing). A decreasing in number was also registered for average-high yielding buffaloes.

The following considerations could therefore be made:

A) a need of better understanding the meaning of

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decreasing of good performing buffaloes in many countries of the Mediterranean Area exists.

B) Specific surveys, based on the use of genetic markers, in order to avoid mistakes in genotyping buffalo populations (Iannuzzi, L. 1994; Moore, 1995) should be carried out. This could in fact be useful to evaluate the need of implementing programs for the most endangered populations.

**REFERENCES**

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**INTERNATIONAL SYMPOSIUM ON BUFFALO RESOURCES AND PRODUCTION SYSTEMS**

**OCTOBER 14 -17, 1996  
ANIMAL PRODUCTION  
RESEARCH INSTITUTE  
CAIRO, EGYPT**

**INTER-REGIONAL  
COOPERATIVE RESEARCH  
NETWORK ON BUFFALO  
FAO**

**OBJECTIVES**

The objectives of the symposium are to provide information on the genetic and feeding resources of buffaloes in the Mediterranean basin as well as production systems and to promote exchange of information and new concepts.

**INTERNATIONAL  
SCIENTIFIC COMMITTEE**

A. PILLA, H. SOLIMAN, A. MOSTAGEER, J. BOYAZOGLU, D. CHUPIN, L. KANCHEV, D. MATASSINO, S. GALAL, F. EL-KIRABY.

FOLLOWS PAGE 16 



**"Buffalo Newsletter"  
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**NATIONAL ORGANIZING  
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land reclamation, Egypt. - FAO,  
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**Scientific programme**

**First Day** : Monday October 14, 1996  
**8:00-9:00**: Registration  
**9:00-10:00**: Opening  
**10:00-11:00**: Coffee  
**11:00-15:00**: Session 1/Genetic Resources.; Keynote Speaker. (Dr.G. Rossi); Short Papers.  
**15:00-15:00**: Lunch  
**15:00-17:00**: Session 2./ Genetic Resources, Keynote Speaker. (Dr.A. Mostageer); Short Papers.  
**19:00- 21:00**: Cocktail Party.  
**Second Day**: Tuesday October 15, 1996

**8:30-10:30**: Session 3./Buffalo Nutrition; Keynote Speaker. (Dr. T. DiIella); Short Papers.  
**10:30-11:00**: Coffee  
**11:00-13:00**: Session 4./Feeding Resources; Keynote Speaker (Dr. H.Soliman); Short Papers.  
**13:00 - 15:00**: Lunch  
**15:00-17:00**: Session 5./ Production.; Systems; Keynote Speaker (Dr.J. Chirgwin, Dr. L.Zicarelli); Short Papers.  
**19:0-21:00**: Sound and Light show (Sphinx)  
**Third Day**: Wednesday October 16, 1996  
One day trip to buffalo farm, El-Fayum.  
**Fourth Day**: Thursday October 17, 1996  
**8:30-10:30**: General Discussion  
**10:30-11:00**: Coffee  
**11:00-13:00**: Closing Session  
**15:00-18:00**: Lunch  
**21:00 - 23:00**: Banquet

**REGISTRATION FORM**

Please type or print in block letters and send the completed form to the Symposium Secretariat 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)**  
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**2. Accompanying person (\*)**  
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**Send to: Dr. F. El Keraby - APRI -**  
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