Buffalo Newsletter

Number 4 - December 1995 EUROPE - NEAR EAST

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

INTERNATIONAL SYMPOSIUM ON BUFFALO REPRODUCTION

The International Symposium on Buffalo Reproduction was held in Sofia, Bulgaria, from 6 to 8 October 1995. It was organized by prof. L. Kanchev of the Institute of Biology and Immunology of Reproduction in Sofia, Coordinator of the working group "Reproduction" of the FAO Inter-regional Cooperative Research Network on Buffalo. The organisation of focused symposia is one of the most relevant activities of this Network, which was established in Cairo in 1992 and the purpose of which is to favour links between researchers on buffalo of different countries. A previous Symposium on buffalo products took place at Paestum (Italy) in 1994. A further Symposium on buffalo resources will be held in Cairo in October 1996. The Bulgarian Symposium, of which it is here referred, had the purpose to examine the research for improving reproduction efficiency through artificial insemination and biotechnologies.

The Symposium on Buffalo Reproduction was attended by 46 participants, from 12 countries: Bulgaria (15), Italy (16), Egypt (4), Turkey (1), Greece (1), Rumania (1), Macedonia (2), Poland (1), USA (1), Argentina (1), Syria (2), Iraq (1). FAO was represented by prof. E.B.E. Galal and dr. Hans Wagner.

The Symposium was organized in three sessions. The topic of the first session (October 6 in the morning) was "Male Reproduction and Artificial Insemination" and the keynote lecture, presented by prof. M.S. Abdou (Egypt) evidenced the following:

- artificial insemination in buffalo is practiced in Egypt, where 30.000 doses per year are used, producing 59% pregnancy at first insemination, with differences according to the season;
- male puberty is attained at 14.2 months, while the best age for mating is about 3 years;
- buffalo semen has a fructose concentration higher than bovine and is more sensitive to freezing injuries.

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– semen concentration and mobility is strangely higher in summer than in autumn, when reproduction efficiency is naturally higher;

– artificial insemination was effected at the end of the oestrous using semen with more than 600 millions/ml spermatozoa.

The keynote paper was followed by discussion and a poster session Buffalo spermatozoa characteristics in particular conditions were evidenced: cold shock freezing and thawing, different media, some enzymes and antibiotics effects.

The topic of the second session (October 6 in the afternoon) was "Physiology and Endocrinology of Reproduction" and the keynote lecture presented by profs. E. Seren. L. Zicarelli, A. Borghese (Italy) referred the results of a National Research Project supported by Italian Ministry of Agriculture, in order to promote buffalo productive and reproductive efficiency. The following research subjects were evidenced:

– Techniques for achieving an early puberty and for maintaining the ovarian activity, presence of the bull, feeding level, season and climate effects on puberty age. The optimum feeding level allows 680 g daily gain and to reach puberty before 20 months.

– Study of oestrus, hormone trend and heat symptoms associated with ovulation in order to improve the efficiency of artificial insemination, which is at present hindered by the variability of the heats in duration and intensity as well as by the variabile distance between the end of the heat and the ovulation and by frequent anomalies, particularly double ovulations.

– Study of post partum anoestrus: days open are less when calving (more in pluriparous than in primaparous) is in March-August than in January-February or in autumn, or in the farms where buffalo cows are separated from the bull in October in order to obtain milk during spring-summer. Moreover, calving interval is remarkably affected by precocious embryonal mortality and by endometritis.

– Study of reproductive seasonality in relation to the photoperiod and to melatonine secretion: cyrcadian rhythm in melatonine secretion was not evidenced in buffalo heifers and cows of the farms which succeeded to have calvings all over the year: therefore melatonine trend may be used as seasonality indicator.

– Methods for oestrus induction: different hormonal treatments (Crestar, Buserelin, Progesterone) have been compared to remove post-partum anoestrus, to reduce days open and to improve fertility.

A long and interesting discussion followed the keynote paper as well as a poster session focused on general physiology, puberty, melatonine secretion, calving interval.

In the third session (October 7 in the morning) on "Biotechnology of Reproduction" the keynote speaker prof M. Drost (U.S.A.) reviewed the biotechnologies of reproduction: superovulation, embryo recovering,embryo transfer, splitting, sexing, ovum pick-up, in vitro maturation, in vitro fertilization, cloning, genetic engineering. The difficulties in the detection of the ovulation hinder artificial insemination, embryo transfer and application of biotechnologies. Moreover in this species 1.4 embryos only for donor are recovered vs. 5.4 in bovine. Therefore Ovum Pick Up, in vitro embryos production and splitting could be useful techniques to increase embryos recovering for donor. Results of a superovulation trial were reported in which 12 out of 14 cyclic buffaloes had an ovarian response producing 6 embryos. Also the posters referred on biotechnologies in buffaloes: ovulation detection, superovulation, embryo transfer, ovum pick-up.

Prof. Kanchev closed the symposium emphasizing the need to continue the research on physiology and endocrinology of reproduction in order to detect the ovulation, avoid seasonality and non-productive times, and to spread out the use of artificial insemination and reproductive biotechnologies.

On October 8 a technical trip was effected to Yavoritz where Agroholding Angora, a private company, keeps over 1000 buffaloes of a typical Bulgarian breed obtained by crossing Indian Murrah and Mediterranean, semen of which is produced to be exported.

A wonderful lunch followed with typical Bulgarian wines and dishes and the Bulgarian experience was concluded visiting the ancient kloster Trojan Monastery.

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INDIGENOUS BUFFALOES IN THE COASTAL AREA OF BANGLADESH

M.O. Faruque

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Bangladesh possesses 0.82 million buffaloes standing 11th in Asia.Bangladesh recorded the highest increase of buffalo population in the world of 5.7% in 1992 over that of 1982 (Sasaki, 1994). Of the total population , 42.8% , 39.9% and 11.8% buffaloes are found in the sugarcane belt, coastal area, and hilly and marshy land (Faruque, et. al.,1990). These buffaloes can be classified into two catagories: (i) Indigenous buffaloes found in the coastal area, marshy land and hilly area of the Eastern and Southern part, (ii) Migrated buffaloes from India found in the sugarcane belt of the Western and Central part of the country (fig.1). Bangladeshi buffaloes are often called non-descriptive types (Cockrill,1974). Attempts have now-a-days been made to describe the indigenous buffaloes in Bangladesh. Amano (1984,1987), Hasnath (1985), Hussen (1990) and Faruque (1994) described the phenotypes, genotypes and productivity of indigenous buffaloes in the central part of Bangladesh. This paper addresses the distribution pattern, phenotypes and productivity of indigenous buffaloes in the coastal area of Bangladesh which is being investigated by the author since 1992.

The experiment was conducted from January,1992 to June, 1994 in the coastal area of Bangladesh covering 10 representative units. A total of 52 house-holds and 3 bathans were suveyed for finding out distribution pattern. Visual observation was made on 2140 buffaloes for phenotype study. Body measurements were taken on 75 buffaloes. Productivity studies were made on 10 first lactating cows, 10 calves, 5 heifers and 8 bullocks. All the animals were maintained traditionally. Measurements of milk yield, body weight, reproductive parameters were taken fortnightly or as required. Fat percent and total solid percent in the milk were determined in the Dairy Technology Laboratory of Bangladesh Agricultural University. From the records, lactation period and yield, growth rate, reproductive efficiency were calculated.

Table 1. Buffalo number/house-hold in the upper part of coastal area

LOCATION	NUMBER OF HOUSE-HOLD	AVERAGE NUMBER OF BUFALO/HOUSE-HOLD	HIGHEST NUMBER	LOWEST
SOUTH EAST	15	5.77 + 0.49	10	2
SOUTH	28	8.07 + 1.46	42	2
SOUTH WEST	9	5.88 + 1.54	15	2
TOTAL	52	6.82 + 0.82	42	2

RESULTS

Dutribution pattern:

The number of buffalo/household in the upper part of coastal area was found to be 6.82 + 0.82 (Table 1). The number of buffalo per house-hold in the south was more than those of South East and South West, but the difference was statistically insignificant (P>0.05). The buffalo number/house-hold in the lower part of coastal area i.e. in the char and island ranged from 30 to 238, and differ significantly (P<0.01) from those of the upper part of coastal area. Buffaloes in the lower part are kept in bathan where buffaloes of several owners are maintained in a single herd which may consists of up to 850 buffaloes. Hussen (1990) and Faruque (1994) reported buffalo number/household as 3.75 + 0.54 and 2.5 + respectively for the Central part of Bangladesh

The grazing facilities in the coastal area and ability of buffaloes to survive against the tidal hazzard are the main cause for higher number of buffaloes in that region. In Indo-Pak sub-continent and FarEast, the

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villagers are found to raise 2-4 buffaloes/family though in some areas of dry zone 100 buffaloes are raised in a single herd as have been reported by Mudgal (1988), Chantakhana and Bunyavejchewin (1989), Ranawana (1989).

Phenotypes:

Coat colour of buffaloes in the South East was predominantly grey. White marking was observed at knee and dewlap. Few albino buffaloes were found. In the South, coat colour of buffaloes varied from grey to black. White marking at knee and dewlap was found in the buffaloes having grey coat colour. White spot on the forehead and at tail-switch was observed in about 15% buffaloes in the South.Coat colour of buffaloes in the South West is black. White spot on the forehead and at tail-switch was found in some cases. Horn of the buffaloes in the South East is crescentic in shape. This type of horn was also observed in most buffaloes of the South and some buffaloes of the South West. Spiral pattern of horn was found in the buffaloes of the South West and in some case in the South.The height, length and heart-girth of buffaloes for different age and sex group in the coastal area has been presented in Table 2.

Productivity:

The productive and reproductive characteristics of indigenous buffaloes in the South West region of coastal area has been presented in Table 3. The productive and reproductive characteristics of indigenous buffaloes are more or less similar to findings of Acharya (1988), Mudgal (1988), Banso (1989), Ranawana (1989), Hussen (1990) and Faruque (1994).

Table 3. Production characteristics of indigenous buffaloes in Khulna

LOCATION	VALUE
Birth weight (kg) (N=9)	22.0 ± 3.5
Weight at yearling(kg) (N=9)	140.0 ± 3.6
Daily growht rate (g/d) (N=9)	267.1 ± 19
Lactation period (d) (N=9)	270.0 ± 4.6
Lactation yeld (L) (N=9)	280.0* ± 3.8
Daily lactation yeld (L/d) (N=9)	1.04 ± 0.09
Fat% in the milk	4.4 - 8.9
Total solid % in the milk	13.4 - 26.1
Puberty age (Female)	48 M
Gestatio period (d)	308 ± 5.4

* young calves suck milk during the same period for which lactation milk production is under-estimated.

Table 2. Body measurements (cm) of buffaloes for different age and sex group

sex and age	SOUTH EAST			SOUTH			SOUTH WEST		
	H	L	HG	H	L	HG	H	L	HG
CALVES (9-12M)	85.0 ±8.8	78.3 ±10.4 N=5	96.0 ±18.3	-	-	-	95.3 ±2.7	92.7 ±2.5 N=9	114.9 ±2.7
HEIFERS (2-4Y)	106.4 ±5.4	102.5 ±9.6 N=7	143.0 ±20.3	112.4 ±8.4	103.0 ±7.5 N=7	154.0 ±26.5	115.3 ±1.7	105.3 ±1.5 N=4	155.0 ±2.2
COWS (<4Y)	127.2 ±5.4	123.2 ±11.3 N=8	188.4 ±12.7	131.2 ±5.3	123.1 ±8.4 N=15	190.0 ±14.8	150.4 ±5.2	135.6 ±4.7 N=10	189.6 ±13.0
BULL/ BULLOCK	-	-	-	-	-	-	154.3 ±3.1	136.7 ±3.1 N=10	190.8 ±4.6

H= Height, L= Lenght, HG= Hearth-girth, M= Month, Y= Year

CONCLUSIONS

Phenotypes, body measurements and productivity indicate that indigenous buffaloes in the South East may be swamp type. Those found in the South may also be indigenous swamp type. However some of them are cross between indigenous swamp and Nili-Ravi.

Indigenous buffaloes in the South West may be river type.However genotypic studies need to be carried out for confirmation of the types.

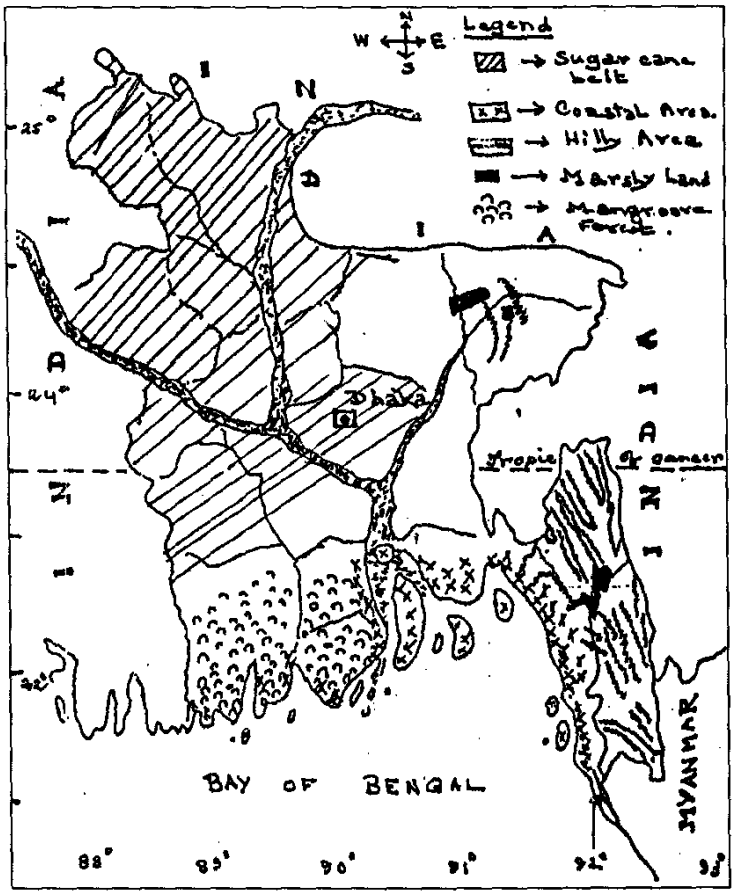

Fig. 1

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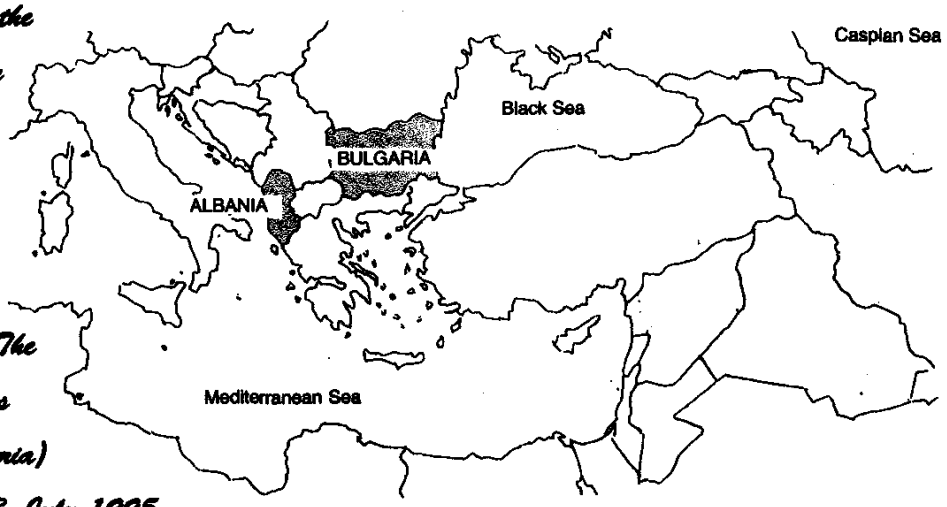
In each issue of the Buffalo Newsletter a description of Buffalo farming in every member country will be presented. The first two countries (Egypt and Syria) appeared in n. 3, July 1995.



BUFFALO POPULATION AND PRODUCTION IN BULGARIA

1 - ORIGIN:
It is supposed that the buffalo has come to Bulgaria more than 12 centuries ago from Byzantium.
- TYPES:
River type:
1. Mediterranean.
2. Indian.
- BREEDS:
Bulgarian (Mediterraneam).
Murrah.
Nili Ravi.
- CROSSING:
Between Bulgarian and Murrah breed 30 years ago. Now most of the animals are crosses F_2 and F_3.

2 - GEOGRAPHICAL AREAS:
1. The South part of the country.
2. The middle parts of Northern Bulgaria.
3. The West part of the country.

3 - NUMBER:
(1995)
(see table 1)

4 - NUMBER OF HERDS:
PRIVATE HERDS: 86%
CO-OPERATIVE HERDS: 11%
RESEARCH HERDS 3%
5 - DESCRIPTION:
(see table 2)

6 - PRODUCTIVITY:
N. DAYS LACTATION/YEAR:
270 days
LACTATION MILK YIELD (KG):
1650
AGE AT FIRST CALVING (MONTHS):
34 - 37
AVERAGE LACTATION NUMBER:
8 years
AGE AT SLAUGHTER FOR YOUNG STOCK:
(only males) 18 - 20 months
WEIGHT AT SLAUGHTER (KG):
400 - 450
- IS THE CALF SUCKLING? **Yes, but not from dams. The calves are being fed artificially by a small bucket.**
- HOW MANY MONTH? **4.**
200 kg buffalo milk.
250 kg milk replacer
500 kg buffalo milk for males selected to future bulls.
- IN ALL HERDS ?
In co-operative and research.
- ARE COWS MILKED ONCE A DAY?
No.
- ARE COWS MILKED TWICE A DAY?
Yes.
- WHERE?
In the pen (co-operative and research).
In the pen or in the yard (private).

table 1

	TOTAL	PRIVATE	CO-OPERATIVE	RESEARCH
Buffaloes	14570	12485	1505	580
Buffalo cows	7254	6489	615	150
Heifers over 2 years	1560	1451	89	20
Adult males	225	191	32	2
Young stock	5531	4357	769	205

- ARE COWS MILKED BY HAND? **Yes (private with 1-2 cows).**
- ARE COWS MACHINE MILKED? **Yes. In co-operative, research farms and own farms with more than 5 cows.**
- TYPE OF MILKING MACHINES? **"Impuls - M" - 624.**

7 – FERTILITY:

N. CALVES/YEAR: **1/2**

SEASON OF CALVING: **Aug - Oct.**

8 – HOUSING:

- Loose housing - young animals (up to 12-14 months).
- Housing tied - dairy cows and heifers.
- Paddock - (for private sector) April to October animals go to the grazing land in the morning (gathered in herds) and come back home in the evening.

9 – ARE BUFFALOES USED FOR DRAUGHT? No.

10 – SOURCE OF FEEDING:

- In private sector: mostly grazing during April-October. Between Nov.- March - straw, hay, concentrates (maize, barley, wheat bran, by-product of cotton, sugar beet etc.).
- In co-operative and research farms

(winter):

- mix concentrates.
- alfalfa hay.
- maize silage.
- straw.
- by-products from sugar and beer production

(summer):

- mix concentrates.
- green fodder (alfalfa, maize).
- alfalfa hay.
- straw.
- by-products.

11 – TOTAL ANNUAL PRODUCTION BY SPECIES.

(see table 3)

12 – MILK RECORDING:

All cows from co-operative and research farms.
Limited number of private sector.

13 – REPRODUCTION:

HAS EACH FARMER HIS OWN BULL? **No.**

ARE THERE BULLS FOR NATURAL SERVICE AVAILABLE IN VILLAGES? **Yes. 1 bull for 50-60 cows.**

HOW MANY? **Few.**

ARTIFICIAL INSEMINATION: **private sector: no. 80% in co-operative and research farms.**

14 – DISEASES:

Free of diseases. Animals are periodically vaccinated against leptospirosis, rinotrachait, mucosac disease complex.

15 - SOCIAL POSITION OF BUFFALO FARMERS.

In the private sector the buffaloes are mainly raised by old people. Their incomes are moderate.
Co-operative and research farms are modern.

16 – PERSPECTIVES OF BUFFALO PRODUCTION:

Total number of the buffalo cows in the country is small and it doesn't have a considerable influence on the milk and meat production in the country.

After the social reform (1989) a lot of the co-operative farms were liquidated and the animals slaughtered. The low prices of the buffalo milk didn't stimulate the farmers to raise buffaloes. During the last 1-2 years the question of financing the stock-breeding was brought up in Bulgaria. The reason for this was the decrease of all species by over than 50%.

No subsides are given up to now and this is the reason for the continuing decrease of the number of the animals including the buffaloes. If the government does not take care for protecting milk and meat prices it is quite possible this decrease to go on.

Giving back the land to the owners some circumstances are created for increasing the number of buffaloes because the buffaloes are not pretentious towards feeding and their raising is comparatively cheap. Buffalo milk and meat are a good source of protein for people's feeding. Bulgaria was famous for its buffalo yoghurt of high quality and meat delicacies - pastarma, lukanka and sausages which were well received at the home and foreign market.

Now the moment is proper for stabilizing and constant upsurge of stock-breeding but unfortunately it will take a long time.

Tsonka Peeva
Buffalo Research Institute, Shumen

table 2

	ADULT MALES	ADULT FEMALES
Height at withers	145	136
Body lenght	158	146
Chest girth	260	215
Body weight	700-900	550-600
Colour	black	
Horns	closely curved	

table 3

	TOTAL MILK MT	CONSUMED FRESH	CHEESE	YOGHURT	BUTTER	MEAT
Buffalo	10000	4000	-	6000	-	
Cow	1126000	400000	416000	300000	10000	50000*
Sheep	182000	50500	76500	15000	-	
Goat	95000	41000	33000	27000	-	40000**

* - the figure includes buffalo and cow meat.
** - the figure includes sheep and goat meat.

BUFFALO POPULATION AND PRODUCTION IN ALBANIA

1 – ORIGIN, TYPE, BREEDS, GROUPS AND CROSSING:
European/Mediterranean

2 – GEOGRAPHICAL AREAS:
coastal

3 – NUMBER:
ADULT FEMALES 70
ADULT MALES } 30
YOUNG STOCK
(decreasing)

4 – DESCRIPTION:
(see table, top)

5 – PRODUCTIVITY:
LACTATION MILK YIELD (K.G):
380-480

6 – ARE BUFFALOES USED FOR DRAUGHT?
Yes, mainly for draught.

7 – SOURCE OF FEEDING:
- Graze only
- roughage
- by-products
- maize/wheat only in winter

8 – TOTAL ANIMAL PRODUCTION (METRIC TONS) BY SPECIES.
(see table, bottom)

9 – PERSPECTIVES OF BUFFALO PRODUCTION:
One reason of the decreasing of buffaloes was the quick collectivisation. At the same time the investments for bonification and the mechanisation of the agriculture were increased. Being considered only as a draught animal, the interest towards this animal was decreased.
We think that the new changes in politics and economy, happening now in Albania will create good conditions for the albanian farmer to come back to this species, but now with new objectives.
The new situation and more particularly the development of the tourism will increase the demand for dairy products from this animal. Milk and dairy products will be very requested. Having that in mind we have now the purpose to develop a project to support the increasing of buffalo population and its genetic improvement.

Y. Bikoku
(Ministry of Agriculture and Food, Tirana)
K. Kume
(Animal Production Institute, Tirana)

	ADULT MALES	ADULT FEMALES
Height at withers	137	126
Body weight	897	465
Colour	black / dark grey	
Horns	backward and sideward	

	ADULT FEMALES N.	TOTAL MILK MT	CHEESE	BUTTER AND GHEE MT	MEAT MT
Buffalo	70				
Cow	170000	850000			80000
Sheep		80000	6100	2160	8000
Goat		55000			4000

SURVEY ON THE RECORDING OF MILK PERFORMANCES OF DAIRY BUFFALOES IN THE WORLD

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INTRODUCTION

During the 29th Session of ICAR (International Commitee for Animal Recording) - Ottawa, August 1994 - the opportunity of defining international guidelines for milk recording in buffalo cows was examined. B. Moioli, a researcher working for the Coordination Board of the FAO inter-regional research network on buffaloes (Europe-Near East) was charged to lead a survey in order to know:

1) the countries where buffalo milk production is of major economic importance;

2) the countries where dairy buffalo individual productivity is already recorded, even at local or research level, and in these cases which rules are applied, as well as the final purposes of such data recording;

3) the countries which might be interested in taking part to an ICAR working group to be created, in which common guidelines for milk recording in dairy buffaloes be defined.

PURSUED ACTIVITY

The Co-ordination Board of the Buffalo Network has prepared a detailed questionnaire, involving both milk recording aspects and general matters on buffalo production systems in each country. On March 1995 the questionnaire was sent to the following countries: more that one questionnaire was sent to each country, i.e. one copy to the staff of the Ministry of Agriculture and further copies to researchers of universities and animal production research institutes: India, China, Pakistan, Thailand Egypt, Indonesia, Nepal, Philippines, Myanmar, Brazil Bangladesh, Sri Lanka, Turkey, Iran, Malaysia, Rumania, Iraq, Italy, Venezuela, Bulgaria, Syria, Greece and Albania.

The following 12 countries have already replied: India, Pakistan, Thailand, Egypt, Bangladesh, Turkey, Iraq, Italy, Bulgaria, Syria, Greece and Albania.

It is known that the majority of buffaloes reared in 4 more countries (China, Indonesia, Philippines and Malaysia) are of swamp type, and that in Rumania buffaloes are not milked, for which we can consider that we have the replies for 17 out of 23 countries (74%).

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COUNTRY	Total buffalo cows	Milk recorded cows	% rec./total	Organization responsible
India	40,000,000	1,500,000	3.75	cooperative of producers
Pakistan	18,700,000	3,000	0,02	experimental projects
Thailand	only swamp			
Egypt	1,031,000	31,000	3.0	farmers
Bangladesh	280,000	160	-	research herd
Turkey	165,000	20	-	research herd
Irak	141,550	250	-	research herd
Italy	75,000	19,627	26,0	breeders society
Bulgaria	6,550	885	13,0	breeders society
Syria	1,800	18	-	research herd
Greece	310	-	-	
Albania	100	-	-	

PRELIMINARY RESULTS OF THE SURVEY

1) General outlook of buffalo importance in the countries which have replied.

In table 1 the economic interest for recording milk productivity of buffalo cows is evidenced in three countries: India (in some federal states only) Italy and Bulgaria. In these countries the producers have recognized the usefulness of such activity either for management or selection purposes and milk recording is effected by appointed technicians.

In Egypt, farmers are being trained to record their cows productions and are being taught of the usefulness of milk recording.

In Bangladesh and Pakistan a few projects are going on in order to implement milk recording of buffaloes as a help for herd management and selection.

In the remaining countries, only in the research herds the milk yield of buffalo cows is recorded.

From Brazil, only oral positive answers were received: buffaloes are milk recorded in some farms. Details will be supplied as soon as possible.

Among the mentioned, there is only one country (Italy) which is already a member of ICAR.

2) Rules for milk recording and results.

In Italy, India, Bulgaria and Egypt, the lactation production is calculated for each animal from the monthly record, according to the common formula accepted for cows. In Bulgaria and Italy, both milk yield, fat and protein are recorded; in India and Egypt, only milk yield and fat.

3) Purpose of milk recording.

In Italy, Egypt, India and Bulgaria an official - document individual lactation certificate - is produced for each recorded cow, and the results of milk recording are used for the genetic evaluation of bulls.

In Syria, Iraq, Bangladesh, Turkey and Pakistan, milk recording is effected only in one or few research herds. The aim is to constitute a nucleous herd for the genetic evaluation of bulls and dams. The best animals will be used in the herds of all country.

4) ICAR working group.

Representatives from India, Italy, Bulgaria and Egypt are prepared to create an ICAR working group on the milk performance recording of buffalo cows. This group will first meet at the 30th ICAR session (Veldhoven, The Netherlands, June 1996).

People of all countries, being interested in dairy buffaloes, having any contribution to give on milk recording, are invited to contact the author. ●

PUBLICATION ON NAGPURI BUFFALOES

Nagpuri Buffaloes are a well defined breed of the Vidarbha region in Maharashtra, in the centre of the the Indian peninsula.

Their various attributes such as sturdiness, compact medium body size and higher fat content in milk retained their popularity in this area in spite of the lower milk yield compared to the Murrah breed. They can also withstand extreme climatic conditions as high as 116 °F (or 47 °C) even in respect of milk yield and fertility. Anybody interested in knowing more about this breed of buffaloes can request the following publication:

Nagpuri (Berari) Buffaloes, by M.S. Kadu, D.W. Khire and S.Z.Ali, to Dr. D.W.Khire, Faculty of Veterinary Science, Punjabrao Krishi Vidyapeeth, Akola 444 104, Maharashtra, India. ●

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RESEARCH PROJECT ON ANIMAL REPRODUCTION-RAIZ

The Italian Ministry of Agriculture, Food and Forests has financed a specific program for research and technological development in the field of animal reproduction:RAIZ.

Within this project, the Animal Production Research Institute, Rome, has carried out a specifical research on buffaloes the purpose of which was to successfully apply artificial insemination by singling out the moment of the ovulation and describing the conditions-oestrus behaviour, ovarian modifications as well as hormonal test values - in which buffaloes are fertile.

The following preliminary results of this research were presented at the International Symposium "Reproduction and Animal Breeding", organized by Società Italiana per il Progresso della Zootecnia, held in Milan, Sept. 11-13, 1995.

HEAT DETECTION IN BUFFALO COWS THROUGH THE USE OF TEASER BULLS. FIRST RESULTS OF THE ARTIFICIAL INSEMINATION

B. Moioli, F. Napolitano, S. Puppo, G.M. Terzano, V.L. Barile, A. Borghese, A.M. Pilla*

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INTRODUCTION

Artificial insemination in Italian buffaloes is practiced in less than 40 of the 206 milk recorded herds and in these herds only on 20% of the cows (3). In fact heat detection is very difficult due to weak estrous symptoms (1). Moreover, the exhaustive research carried out on the endocrinology of Italian buffaloes (2) has not included the insemination. Therefore it was impossible to correlate oestrous physiological and hormonal status with fertility. Purpose of the trial was to observe the behaviour of buffalo cows kept together with vasectomized bulls as well as the behaviour of the bulls, in order to find out the most suitable moment for insemination.

MATERIAL AND METHODS

Thirty-eight buffalo cows were observed continuously for three months, day and night; they were kept in a paddock with two vasectomized bulls. The behaviour of the bulls was the following: they walked behind a buffalo cow, smelling and/or licking her vulva; they covered a buffalo cow even several times a day for one to six days, sometimes penetrating her. sometimes not. The corresponding behaviour of the buffalo cows was also evidenced. All buffalo cows were inseminated at the most suitable moment according to estrous signs and physiological status of genitals.

24 hours later a second insemination was effected with a different bull.

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Table 1. Moment of insemination

	PREGNANT		NON PREGNANT	
	N°	X±S.D.	N°	X±S.D.
Duration of the heat (hours)	19	81.8±75.1	42	65.3±60.4
Beginning of heat to 1° insemination	20	78.1±72.1	46	64.3±46.8
Insemination-end of the heat (hour)				
– Before the end	8	24.4±16.7	16	29.9±19.0
– After the end	11	15.9±3.1	26	18.0±9.6

Table 2. Physiological factors influencing the success of inseminations

EFFECT		PREGNANT	NON PREGNANT	P<
Uterus:	tonic	19	37	0.13
	soft	1	10	
Follicles:	flabby	17	29	0.07
	taut	3	18	
Courtship:	intensive	15	25	0.10
	poor	5	22	
Mucous discharge:	clear	6	10	0.69
	none	11	27	
	cloudy	3	10	

The following parameters:

1) duration of the heat in hours;

2) number of hours from the beginning of heat to insemination;

3) number of hours from the insemination to the end of the heat; were compared between pregnant and non-pregnant.

Number of successful and unsuccessful insemination was compared on the basis of the following factors:

1) Intensity of bull attraction (intensive/poor);

2) Status of uterus (tonic/soft);

3) Follicle status (taut/flabby);

4) Mucous discharge (none, clear, cloudy).

RESULTS

Heats were longer in pregnant cows (table 1).

Time from beginning of heat to insemination was longer in pregnant cows (table 1).

The distance of the insemination (table 1) from the end of the heat was shorter in pregnant cows both if the insemination was effected before the end or after the end of the heat.

Data referred to insemination-end of the heat are preliminary data because 2 consecutive inseminations were effected.

When calves will be born patemity test will show which of the two insemination was fertile.

Pregnancies were more frequent with intensive courtship, tonic uterus and flabby follicle (table 2).

CONCLUSIONS

Bull behaviour was very important to determine the beginning, the end of the heat and the intensity of the courtship.

AI was more successful when effected after an intensive courtship, i.e. continuous and frequent matings all over the day.

The end of the courtship was an important moment to evaluate when AI had to be effected, supported by the check of physiological status of genitals i.e. tonic uterus and flabby follicle.

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STUDY ON THE BACTERIAL AETIOPATHOLOGY OF MORTALITY IN BUFFALO AND COW NEONATES

Ahrar Khan

Faculty of Veterinary Science, University of Agriculture, Faisalabad, Pakistan

This study was concluded on 325 neonates of Nili-Ravi buffalo and 354 of Sahiwal cows maintained at the Livestock Production Research Institute, Bahadurnagar during 1990 to 1992. The overall incidence of mortality among buffalo and cow neonates was 7.08 and 11.02 per cent, respectively. The mortality was not influenced by sex and birth weight but age of neonates, parity of dams and season of the year had a significant effect. The mortality was significantly higher during 3rd week, summer and among neonates of 2nd parity dams.

Diarrhoea in neonates of both the species caused higher morbidity, mortality and fatality than pneumonia and pneumo-enteritis. Navel-ill, umbilical hernia and mange caused only morbidity whereas heat stroke proved fatal in one cow neonate.

Haematological values with regard to sex of neonates and parity of the dams showed non-significant differences in both the species. The number of RBCs was significantly less whereas Hb. concentration, PCV, MCV, MCHC and TLC were significantly higher at birth in healthy neonates. Significantly low ESR at birth in buffalo neonates was recorded whereas in cow neonates it showed non-significant variations. Rouleaux formation was observed in buffalo neonates. Neutrophils showed significantly higher counts at birth than lymphocytes and from 2nd week onward, lymphocytes were more in number than neutrophils and this trend continued upto 4th week of age in neonates of both the species.

In diarrhoeic and pneumo-enteric buffalo and cow neonates significantly higher values of RBC and PCV were recorded whereas MCHC were significantly decreased. Leukocytosis mainly due to neutrophilia along with lymphocytopenia was recorded in diarrhoea, pneumonia and pneumo-enteritis in neonates under observation.

Significantly higher morbidity due to diarrhoea, pneumonia and pneumo-enteritis in neonates having intermediate and low concentration of IgG_1 was recorded with a relative risk of 3.65 and 5.03 times more in buffalo and 3.21 and 4.28 times more in cow neonates. Mortality was three times more in neonates having intermediate and as high as nine times in neonates with low IgGI concentration as compared to neonates having high IgG_1 concentration.

Enteropathogenic *E. coli* and Salmonella spp. were isolated from faecal samples of diarrhoeic neonates. The incidence of the former was significantly higher in Ist week and of the later in 3rd week of age. Bacterial organisms isolated from nasal discharges of pneumonic neonates showed highest incidence of *Pasteurella haemolytica* followed by *Corynaebacterium pyogenes*, Staphylococci, Streptococci and *P. multocida*.

Diarrhoeic lesions in neonates of both the species were nearly the same whether caused by enteropathogenic E. coli, Salmonella spp. or with no established aetiology. Carcasses showed moderate to severe emaciation and dehydration. Milk curds in abomasum and mucosal haemorrhages were recorded. Lesions in the duodenum were minimal and less severe than those in the jejunum and ileum which showed focal to diffuse hyperaemia and petechial or linear haemorrhages. The faeces were yellowish-watery mixed either with mucous, blood or fibrino-necrotic material. Hepatome-galy with distended gall bladder were also observed.

Histologically, the most severe and most frequent changes were observed in the mucosa, followed by those in the submucosa, muscular and serosal layers of small intestines of diarrhoeic neonates. Sloughing of lining epithelium and villi, congestion on the tips of villi along with stunting and fusion and in severe cases, necrosis of villi were the salient features. Among infiltrating cells, neutrophils were followed by lymphocytes, plasma cells and macrophages in lamina propria, periglandular areas and lumen of crypts of Lieberkuhn. The submucosa showed dilatation, oedema and congestion. Sections of intestines of buffalo neonates having parasites in their lumen showed sloughing of villi, hyperplasia of crypts of Lieberkuhn, massive infiltration of neutrophils and few macrophages in the periglandular areas. Buffalo and cow neo-

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nates died of pneumonia and pneumo-enteritis showed diffusely distributed consolidated areas in the apical, cardiac and intermediate lobes which appeared congested or anaemic and firm in consistency.

The overlaying thickened and congested pleura was covered by serofibrinous inflammatory exudate. The affected lobules yielded frothy, sanguinous or mucinous exudate from the bronchi and bronchioles. Histologically, the alveolar capillaries were dilated and studded with blood. Congestion and infiltration with neutrophils was followed by lymphocytes, plasma cells and macrophages in the peribronchiolar connective tissue and within the bronchiolar walls. The alveolar lumens were filled with RBCs, neutrophils, few macrophages and desquamated epithelial cells. Alveolar septa was thickened whereas the interlobular septa was dilated with exudate, inflammatory cells, some newly formed fibroblasts and capillaries.

RIVER BUFFALO BACK IN THE LAND OF MILK AND HONEY

by Daniella Ashkenazy

MOSHAV BITZRON, ISRAEL.

In Biblical times, the Land of Israel was described as "a land flowing with milk and honey." Among the dairy herds were not only goats, sheep, and cattle, says Israeli farmer Hagai Trister, but also water buffalo - *tau* in Hebrew. These are mentioned in the Book of Leviticus as one of the kosher animals that could be sacrificed at the Temple in Jerusalem and that Jews were permitted to eat. While Israel still maintains its reputation as "a land flowing with milk and honey," today there are almost no river buffalo left.

Trister, a veteran dairy farmer, decided to enlarge his 75-head dairy herd by reintroducing water buffalo to the local dairy industry. He recently imported 55 six-month-old river buffalo calves from Italy and brought them to his farm on Moshav Bitzron, south of Rehovot. "I saw the river buffalo when travelling in Italy and decided to invest in a commercial herd," explained Trister. "Their milk is used not only to make excellent ice cream, but also Mozzarella cheese."

"One should not confuse the jamouse or river buffalo with swamp buffalo native to rice cultures of the Far East," clarified Dr. Yaakov Kali, head of the Israeli Ministry of Agriculture's Livestock Division, which is supporting Trister's experiment to "bring back the buffalo."

"River buffalo were native to the Middle East region - to Egypt, Syria and Iraq, as well as to former wetlands along river outlets on Israel's Mediterranean coast and to the former Hula Swamp north of the Sea of Galilee," explained Kali. "We can find river buffalo mentioned in Biblical and Talmudic texts." ●

A curious news item about buffalo milk in 19th century ...

From the report of the jurymen after the exhibition of agriculture, arts and industry held in Salerno on September 1871:

... when the stretched soft cheese made from buffalo milk is produced, the hot water poured upon the curd is filled with a fat matter popularly called 'butter'. Such fat matter is preferred to oil by the dairymen, as a seasoning in food, because it proved to keep rheumatic diseases away.

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TECHNICAL WORKSHOP TOWARD THE IMPROVEMENT OF BUFFALO PRODUCTIVITY IN EGYPT

On July 10 and 11, 1995, a technical workshop toward the improvement of buffalo productivity in Egypt took place at Cairo. The workshop was organ-ized on the basis of a bilateral agreement between the Italian and the Egyptian governments, according to which Italy is prepared to providing aid to improve buffalo production in the Beheira governorate of Egypt through a 5 years project. Representative of the Egyptian government is the Animal Production Research Institute (APRI), Ministry of Agriculture; representatives of the Italian government are the Science Department of the Italian Embassy of Cairo (Dr. Valenza and Miele) and the Department of Animal Production, University of Udine (Prof. P. Susmel).

The objectives of the workshop were:
– to establish a framework for a project document for the expected Italian aid;
– to sharpen the objectives of the planned project.

Approximately 60 participants attended the workshop: they came mainly from the research and academic community in the Egyptian Universit-ies and the Ministry of Agriculture and other research centres; donor organizations and development agencies. During the first day of the workshop plenary sessions were held with the following lectures:

1 - Buffalo breeding and farming systems:
- 1.1 - Buffalo breeding within the prevailing conditions in Egypt (Ahmed Abd-El-Aziz, Cairo University);
- 1.2 - Alternative approaches for genetic improvement of buffaloes in Egypt (E.S.E. Galal, FAO-RNEA, Cairo);
- 1.3 - Genetic improvenet in buffaloes (Houssain Mansour, Ain Shams University);
- 1.4 - Steps to be taken for the improvement of buffaloes (G. Van Rootseler, FSDP-PIU);
- 1.6 - Potential of commercial dairing with buffaloes (Gamil H.Metri, APRI, Cairo).

2 - Marketing of buffaloes and milk products:
- 2.1 - Aspects of buffalo milk marketing in the Nile delta (R. Donald, FSDP-PIU);
- 2.2 - Marketing of milking buffaloes. (S. Mohamed Ali, Agric. Econom. Res. Inst., Cairo).

3 - Buffalo Nutrition:
- 3.1 - Impact of nutrition on sexual puberty, maturity and age at first calving (Mohamed El-Ashry, Ain Shams University):
- 3.2 - Effect of using non-hormonal growth promoters on the productive performances of buffalo calves (Hamdy M. Khattab, Ain Shams Univer-sity).

4 - Reproduction and disease control in buffaloes :
- 4.1 - reproductive performance in Egyptian buffaloes in relation to season and managerial practices (A. Barkawi);
- 4.2 - Improvement aspects of buffalo breeding (Reda M. Khattab, APRI, Cairo);

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4.3 - The endemic diseases of Egyptian buffaloes in relation to productivity (Mowafaq Halwa, Directorate Vet. Services, Beheira Governatorate).

On the second day, participants split into four subgroups: breeding and production systems, nutrition, reproduction and marketing. They discussed in detail in relation to the stated objectives. Outputs from the groups were discussed in a plenary. Tentative title and project objectives were reached, as follows: the establishment of a sustainable system for the increase of the return from small-scale buffalo farmers in Beheira Governorate. •

THIRD SYMPOSIUM OF THE FAO INTER-REGIONAL RESEARCH NETWORK ON BUFFALO

The third Symposium of the Buffalo Network will be titled 'BUFFALO RESOURCES' and will be held in Cairo, Egypt, on 14-17 October 1996. Anyone wishing to take part to it is invited to write to: Dr. F. El-Kirabi, APRI, Nadi El-Seid Street, Dokki, Cairo (Egypt).

A SATELLITE SYMPOSIUM: "ROLE OF WATER BUFFALOES IN PRODUCING FOOD"

Will be held within the 8th Conference of the World Association for Animal Production, which will take place at Seoul, Korea, 22-27 June 1998. For contacts write to: Organizing Committee 8th WCAP, College Agriculture and Life Sciences, Seoul National University, Suweon 441-744, Korea. tel. 82 331 292 0896 fax 82 331 292 3801.

FIFTH WORLD BUFFALO CONGRESS

The International Buffalo Federation will organize the fifth World Buffalo Congress at Caserta (Italy) in October 1997. Organizing Committee: contact prof. G. De Franciscis, A.P.A., via Nazario Sauro 26, 81100 Caserta (Italy), phone ++39-823-325945.

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