

HOUBARA BUSTARD: AN EXPERIENCE OF REARING CHICKS IN NAG VALLEY (BALOCHISTAN), PAKISTAN

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Abstract. Three chicks of Houbara were received on 29.04.1999 at the age of about three weeks in Houbara Research, Rehabilitation and Breeding Center (HRRBC) Nag Valley, Balochistan. The weights of chicks on their arrival were 320, 220 and 220 g. Two chicks of five weeks age were received on 19.05 in HRRBC with weight of 360 and 380 g. Similarly 6th chick was received on 25.05 in HRRBC with weight of 565 g. All the chicks were ringed with HFIP rings and vaccinated. They were fed with poultry feed, lizards, insects, beetles, snakes, alfalfa, cabbage and spinach. The growth rate of chicks was monitored for two months. One chick was died.

Key words: Houbara Bustard, *Chlamydotis undulata*, Pakistan, conservation, captive breeding, growth.

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Опыт выращивания птенцов джека в долине Наг (Белуджистан) в Пакистане. - М.С. Надим, А.А. Миан, М. Асиф, Г. Рашид, М.С. Ахтар, Г. Муджтаба. - Беркут. 14 (2). 2005. - Излагается опыт выращивания птенцов в Центре по изучению, реабилитации и размножению джека (Houbara Research, Rehabilitation and Breeding Center). Всего в 1999 г. было получено 6 птенцов, один впоследствии погиб. Все они были окольцованы и вакцинированы. Кормили птенцов кормом для домашней птицы, ящерицами, насекомыми, змеями, люцерной, капустой и шпинатом. На протяжении двух месяцев отслеживался их рост.

Introduction

In common with several other bustard species, the Houbara (*Chlamydotis undulata*) is a game bird. Thus it has to bear the burden of mortality from hunting, in addition to normal natural population controls (food availability, predation and disease) (Goriup, 1983). Since the mid-1960s, Pakistan has hosted falconers from Gulf countries who come to hunt the Houbara Bustard (it is protected under the national law) under special licenses issued by the Ministry of Foreign Affairs. Until the mid-1980s, the hunting parties were estimated to kill between 3,000 and 7,000 birds each year (Goriup, 1982; Mian, 1986). Mian and Dasti (1985) and Mian (1986) also reported hunting activities in Western Balochistan. According to them, in 1982–1983 alone, 5,000 to 6,000 birds were killed. Population in Sind and Punjab was 30 % lower in 1971 than it was in 1960 (Mirza, 1985; Surahio, 1985). In addition, there is a considerable amount of poaching by local hunters and

extensive trapping and smuggling to provide falconers with houbara bustard to train their falcons (Pakistan National Report to CMS, 1995). This harvest is thought to amount to between 4,000 and 7,000 birds (Goriup, 1997).

The alarming decline of the Houbara Bustard has led to conservation studies by Arab falconers who are now investing their resources to research birds' status as well as conservation. The type and intensity of research is variable, and is being conducted throughout the Houbara's range. One of the measures for conserving bustards has been the establishment of captive breeding and reintroduction schemes. In order to have healthy birds it is necessary to create favorable conditions during the period of chick growth. If the conditions of life do not correspond to the requirements of a developing chick, then in subsequent stages it would be necessary to take urgent measures to correct them in order to restore the normal processes of vital activity. Thus a constant control on the development of young birds, which



are reared in captivity, is required. Houbara Research Rehabilitation and Breeding Center (HRRBC) was established in Nag Valley (see map) January 1999 with the following objectives:

- to rear the breeding stock of Houbara Bustard for captive breeding, by collecting eggs/chicks, or both from potential breeding areas of Balochistan;
- release of captive-bred Houbara in Nag Valley to restore the resident breeding population in the area;
- post-release monitoring of Houbara and its survival rate in the wild;
- to monitor the resident breeding population of houbara in Nag and other potential breeding areas of Balochistan;
- to study the ecology of Nag being a breeding habitat of Houbara Bustard;
- to study the management problems of houbara in captivity;
- to provide medical care to Houbara confiscated in Balochistan during smuggling;
- to rehabilitate the confiscated Houbara.

Material and Methods

Initially the chicks received at the end of April 1999 were kept in a cemented room (3 m × 3 m) of the laboratory as there was no brooder house in the HRRBC. The room was partitioned by hard board, into three parts. Two chicks were kept in one compartment and the other three in the second compartment while the third compartment was reserved for a sick chick. The chicks were brought in at the age of about 3 weeks. At the age of 10 weeks they were transferred to the brooder houses, two of which were completed during this period. Three chicks were transferred to one brooder, two to the second while the sick chick was confined to the cemented room of the laboratory. The dimensions of brooder pens and their



Map of Balochistan.
Карта Белуджистана.

attached compounds is 4 × 4 × 2 m. The brooder pen (not compound) is further divided into two parts: one serves as the brooder while the second part will be used to store their feed, utensils and other necessary items.

The chicks were fed by pelleted poultry feed, lizards, beetles, snakes, insects and green forage plants like alfalfa, cabbage and spinach when available. Morphometry of chicks was taken and all records of chicks were maintained on separate sheets.

Results

On 19 April 1999 we received 3 dead chicks 4–6 days old. The chicks died possibly due to starvation, dehydration and cold. The post mortem report showed congestion of lungs which could be due to cold. The stomach was empty except for few pieces of beetles which were fed by their mother after hatching. Their morphometry suggested that possibly two could be males and one female (Appendix 1)

We received another 3 chicks on 29 April 1999 (Photo 1). They were 3 weeks old, with 320, 220 and 220 grams weights. They were

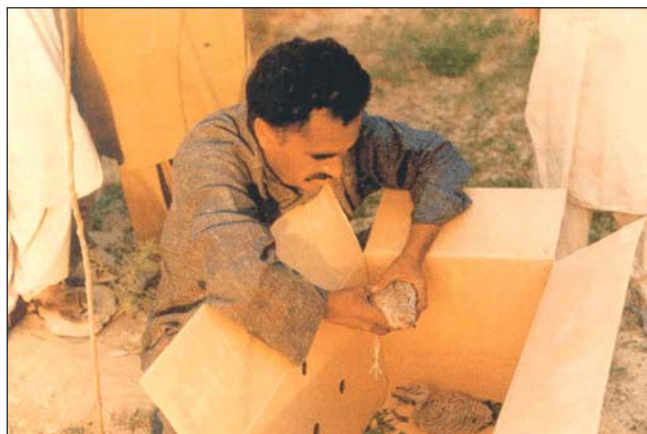


Photo 1. Three weeks old chicks in HRRBC.
Фото 1. Трехнедельные птенцы в Центре.

in good condition, looked hungry and immediately started taking lizard pieces by hand. During first few days vitamins and antibiotics were given to them in drinking water as a prophylactic measure. Insects and pieces of lizards were offered to them, which they ate voraciously. Their morphometry, taken on arrival, is given in Appendix 2.

A second batch of two chicks was also brought to the HRRBC on 19 May 1999. They were about 5 weeks old. One was lame. Their weights at the time of arrival were 360 and

380 grams. Their morphometry is also given in Appendix 2. They too started taking food by hand immediately after arrival at HRRBC. The sixth chick about 7 weeks old (565 grams in weight) was received on 25 May 1999. It was weak, but it ate well and improved, although its gain in weight was slow.

All the chicks (Photo 2–3) were ringed and regularly vaccinated against Newcastle and Fowl Pox diseases. They were fed pelleted poultry feed, lizards, insects, beetles and snakes. Moreover alfalfa, cab-

bage, spinach were also given when available. Vitamins were supplemented in drinking water to make up any deficiency in the feed preparation. Initially lizards were given twice a day but after 8 week of age, lizards are being fed only once a day. Their growth rate and feed consumption record was maintained and is depicted in Tables 1–4. As there were no separate pens for chicks, so their actual feed consumption could not be calculated as on single bird basis. Therefore, feed was collectively weighed for all birds and then average feed

Table 1

Daily and weekly feed intake of Houbara chicks (type of food: lizards, beetles, insects, snakes)

Дневное и недельное потребление пищи птенцами джека (тип пищи: ящерицы, жуки, насекомые, змеи)

Age in weeks	Food intake (g) per week	Average food intake (g) per day	Average food intake (g) per chick per day
05	805	115.00	38.33
06	1090	155.71	51.90
07	1675	239.80	47.85
08	1960	280.00	46.66
09	1205	172.00	28.69
10	1075	153.57	25.59
11	1060	151.42	25.23

intake per bird per day was calculated. Chicks no. 405 and 401 ate pelleted feed very well while chick no. 402 and 403 ate moderately. But chick no. 406 eats only a little or no pellets and therefore its weight gain is slow i.e. only 2.14 grams per day in the 9th week and 5.0 grams in the 10th week.

Chick no. 401 fell sick on 13 May 1999. The visible symptom was head shaking otherwise the chick was fine, eating well, gaining weight (Tables 2



and 3) and yielded normal dropping. He could not pick the food easily due to head shaking, therefore efforts had to be made to feed this bird by hand. It was probably a nutritional deficiency disease. So in addition to antibiotic, B-complex injections and vitamins in drinking water were given. The chick recovered within two weeks. This chick again developed leg problem in the 9th week and was unable to stand. It started losing weight (6.42 grams per day) in this week. This could be due to food deficiency, as animal protein food was reduced to 50 % in the 9th week. The chick recovered when additional protein food was supplied.

Chick no. 404 became seriously ill in the 7th week and lost 40 grams weight in one week (5.71 grams per day). The bird lost appetite, dropped his head on the ground and excreted greenish diarrhea. Immediately, antibacterial injections were given in addition to B-complex injections and vitamins in drinking water. The chick was force-fed for 15 days and then showed a little improvement. The exact

cause of disease was not known. But probably the food (lizards, insects and reptiles are vectors and intermediate hosts for parasites or other diseases) was responsible for the sickness. After 20 days the chick was able to stand and walk few steps but unfortunately died on 22 June. Post mortem report showed blood clotting in all tissues. Liver was discolored due to disease.

The birds were often anxious, and damaged the skin of their wing tips while striking to walls during fluttering. Chick no. 405 injured his leg



Photo 2. Five weeks old chick.
 Фото 2. Пятинедельный птенец.

Table 2

Weekly weight gain/loss of Houbara chicks
 Еженедельные изменения веса тела птенцов джека

Age in weeks	Weight gain (g)						Weight loss (g)					
	Chicks identity						Chicks identity					
	401	402	403	404	405	406	401	402	403	404	405	406
03	320	220	220									
04	455	360	335									
05	515	455	430	360	380							
06	590	575	555	470	520							
07	660	690	620	575	690	565						
08	795	790	755	535	805	720				40		
09	750	865	820	545	935	735	45					
10	855	935	905	580	990	775						
11	910	995	965			810						



Photo 3. Eight weeks old chick.
 Фото 3. Восьминедельный птенец.

by striking with the mesh of the pen, but recovered in 10 days and again injured his wing after hitting the wall during flight. Chicks no. 403 and 402 also received injuries in leg (Photo 4) and wing respectively by hitting the wall, but recovered within a week.

The chicks (Photos 5–7) stayed together all the time, frequently communicating to each other and uttering a characteristic “Kurr – Kurr” sound. They also emitted soft calls while waiting for food. If we whistled to them, they responded and called back. Generally they became alarmed if anyone entered the pen, and tried to escape by running or trying to fly, emit-

ting a distress call at the same time. The chicks were easily disturbed and distressed. But once the distressing stimulus was removed, they calmed down. They showed comfortable behavior like preening and relaxing themselves by spreading out the feathers. Morphometry carried out after two months is given in Appendix 3. They attained the size of adult birds. Their morphometry suggests that possibly there are four males and one female.

Discussion

Captive breeding programs have been undertaken in Israel (Mendelssohn et al., 1979), Abu Dhabi, Saudi Arabia, Morocco and Al Ain Zoo in Abu Dhabi. Some authors (e.g. Launay and Paillat, 1990) consider captive breeding essential for the conservation of Houbara, while others (Gewelt, 1982; Goriup, 1989) have questioned its usefulness as the sole method for restoring population. Gewelt (1982) believed that the breeding of houbara in captivity would not be a simple process comparable to rearing pheasants. Goriup (1989)

Table 3

Growth rate per chick per week
 Недельная скорость роста птенцов

Age in weeks	Weight gain (g)						Weight loss (g)					
	Chicks identity						Chicks identity					
	401	402	403	404	405	406	401	402	403	404	405	406
04	135	140	115									
05	60	95	95									
06	75	120	125	110	140							
07	70	115	65	105	170							
08	135	100	135	–	115	155				40		
09	–	75	65	10	130	15	45					
10	105	70	85	35	55	35						
11	55	60	60			40						



pointed out that none of the captive breeding for reintroduction schemes has ever approached success in terms of holding a self-sustaining population in captivity. Goriup (1989) also states that “unfortunately, bustard breeding schemes have usually tended to divert attention and resources (captive breeding is very costly) from research on population dynamics and habitat requirements of wild birds”. Goriup (1989) believes strongly, that habitat and population management (such as that taking place in Canary Islands) is the best way for bustard conservation.

Fyfe (1975) started review on reintroducing endangered birds to the wild, stating that, he had been unable to locate a single example of self-sustaining wild population that resulted from the reintroduction of an endangered bird back into its original habitat.

The work presently being carried out in Taif, Saudi Arabia, by the National Wildlife Research Center (NWRC) is the most ambitious and well-managed effort ever undertaken



Photo 4. Injured leg of a chick.

Фото 4. Раненая нога одного из птенцов.

and will be the ultimate test of whether bustards really have the inherent potential to respond to intensive captive management on a large scale (Goriup, 1989). Even if captive breeding schemes do eventually produce large numbers of houbara, its relevance to re-establishing wild houbara population is at best unknown and likely to be dubious. Gewalt (1982) questioned the suitability of captive bred birds for release into the wilderness. This is yet to be established.

Launay and Paillat (1990) and Goriup

Table 4

Average weight gain per chick per day during each week
Средний прирост веса за неделю

Age in weeks	Weight gain (g) Chicks identity						Weight loss (g) Chicks identity					
	401	402	403	404	405	406	401	402	403	404	405	406
04	19.28	20.00	16.42									
05	8.57	13.57	13.57									
06	10.71	17.14	17.85	15.71	20.00							
07	10.00	16.42	9.28	15.00	24.28							
08	19.28	14.28	19.28	–	16.42	22.14				5.71		
09	–	10.71	9.28	1.42	18.57	2.14	6.42					
10	15.00	10.00	12.14	7.00	7.85	5.00						
11	7.85	8.57	8.57			5.71						



Photo 5. Imprinting of chicks.
 Фото 5. Импринтинг птенцов.

(1989) both believe that research on semi-captive birds at NWRC could answer important questions on the houbara's behavior and habitat needs.

Although the captive breeding program at HRRBC is important for long term conservation, but for rearing the basic breeding stock, the chicks should be arranged from Saudi Arabia or some other breeding center like that of UAE, in order to avoid disturbance of the resident breeding population of Houbara, as the



Photo 6. Chicks in brooder pen.
 Фото 6. Птенцы в загоне.

collection of eggs/chicks causes serious damage to the breeding population.

Suggestions

- Well-equipped veterinary department with trained staff is immediately required in HRRBC. Rearing chicks without it, is only killing of valuable chicks and resources.

- Fully equipped laboratory with trained technical staff is another requirement for the diagnosis of diseases, so that the birds could be treated properly.

- Brooders should be completed as soon as possible so that chicks could be housed singly, to record their growth rate, feed intake and feed conversion ratio of individual chicks.

- Food rearing house (for mice, mealworms, crickets, locusts, beetles, etc) is another urgent need.

- Chicks should be arranged from well-established breeding centers, so that the HRRBC could be run more efficiently with larger numbers of birds.

- Breeding pens should also be constructed as soon as possible.

- The HRRBC should be fenced as early as possible, to prevent trespassing by livestock and shepherds.

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Table 5

Temperature record of HRRBC in 1999
Температуры в Центре в 1999 г.

Month	Ave Min	Ave. Max.	Lowest	Highest
January	5.22	15.92	1	16
February	6.10	18.21	2	18
March	12.15	24.81	7	30
April	16.16	29.96	11	34
May	20.29	33.58	15	37
June	23.60	37.83	17	41
July	27.20	38.31	20	42
August	24.35	37.67	20	39
September	21.40	34.36	16	38
October	13.14	28.70	10	30
November	8.90	24.66	5	27
December	4.90	17.25	1	20

and Population Management. Wildlife Conservation and Development in Saudi Arabia. - Proc. of the First Symposium. Rhyadh, 1987.

Launay F., Paillat P. (1990): A Behavioral Repertoire of the Adult Houbara Bustard (*Chlamydotis undulata macqueenii*). - Rev. Ecol. 45: 65-88.

Mendelssohn H., Marde V., Stavy M. (1979): Captive Breeding of Houbara (*Chlamydotis undulata macqueenii*) and a Description of its Display. Bull. ICBP. 13: 134-149.

Mian A., Dasti A.A. (1985): Houbara Bustard in Balochistan 1982-83. A Preliminary Review. - Bustard Studies. 3: 45-49.

Mian A. (1986): Ecological Impact of Arab Falconry on Houbara Bustard in Balochistan. - Envir. Conserv. 13: 41-46.

Mirza Z.B. (1985): Houbara in Cholistan. - International Symposium on Bustards, Peshawar, Oct. 4-7, 1983.

REFERENCES

Fyfe R.W. (1975): Reintroducing Endangered Birds to the Wild. - Endangered Birds' Management Techniques for Preserving Endangered Species. 36: 323-329.

Gewelt (1982): Project on Conservation and Captive Breeding of the Houbara Bustard. Bustard in Decline 1983. - Tourism and Wildlife society of India.

Goriup P.D. (1982): The Houbara Bustard (*Chlamydotis undulata macqueenii*) in Morocco. Report of the Al-Areen / ICBP, March 1982, Preliminary Survey.

Goriup P.D. (1983): Houbara Bustard (*Chlamydotis undulata macqueenii*). Research and Conservation in Pakistan. - Bustard in Decline. 267-272.

Goriup P.D. (1997): The world status of the Houbara Bustard. - Bird Conserv. Intern. 7: 373-397.

Goriup P.D. (1989): Status and Conservation of Bustards in the Arabian Region with reference to Falconry



Photo 7. Chick hiding in plants.
Фото 7. Птенец, спрятавшийся в траве.

Surahio M.I. (1985): Ecology and Distribution of Houbara Bustard in Sind. - Bustard Studies. 3: 55-58.

Appendix 1

Measurements (mm) of three dead chicks
Промеры (мм) трех мертвых птенцов

Ring No.	Weight	Skull	Beak length	Beak width at nostril	Tarsus	Toe + claw	Toe - claw	Sternum	Wing	Tail
-	-	50.9	29.7	7.4	36.7	22.7	19.1	20.2	43	-
-	-	51.9	27.7	7.3	36.8	22.7	19.1	19.7	38	-
-	-	47.1	26.9	6.9	34.2	21.1	18.4	17.8	40	-

Appendix 2

Measurements (mm) of three chicks on arrival (3 week old)

Промеры (мм) 3 трехнедельных птенцов после получения

Ring No.	Weight	Skull	Beak length	Beak width at nostril	Tarsus	Toe + claw	Toe - claw	Sternum	Wing	Tail
401	320	75.1	40.1	10.8	61.2	33.5	29.5	49.8	195	–
402	220	67.7	36.9	10.1	53.6	30.6	24.8	39.8	180	–
403	220	67.1	35.4	10.8	53.1	30.5	24.5	39.1	160	–

Measurements (mm) of two chicks on arrival (5 week old)

Промеры (мм) 2 пятинедельных птенцов после получения

Ring No.	Weight	Skull	Beak length	Beak width at nostril	Tarsus	Toe + claw	Toe - claw	Sternum	Wing	Tail
404	360	79.4	46.1	9.9	68.9	34.5	26.8	57.7	280	–
405	380	80.0	45.3	10.7	74.8	36.9	28.7	55.5	260	–

Measurements (mm) of one chick on arrival (7 week old)

Промеры (мм) семинедельного птенца после получения

Ring No.	Weight	Skull	Beak length	Beak width at nostril	Tarsus	Toe + claw	Toe - claw	Sternum	Wing	Tail
406	565	86.1	50.4	11.8	84.3	36.8	30.4	73.7	305	160

Appendix 3

Measurements (mm) of chicks at the age of two months

Промеры (мм) двухмесячных птенцов

Ring No.	Weight	Skull	Beak length	Beak width at nostril	Tarsus	Toe + claw	Toe - claw	Sternum	Wing	Tail
401	795	98.4	55.1	12.9	87.6	42.3	34.8	82.2	360	170
402	790	92.2	52.9	12.1	84.0	40.6	31.9	80.1	340	175
403	755	91.0	54.4	12.1	84.7	41.5	30.8	81.1	335	170
404	535	87.3	54.1	10.2	82.4	36.7	32.5	71.2	340	145
405	805	93.8	54.7	11.3	86.6	43.0	34.8	83.8	340	165
406	720	90.5	54.0	12.8	85.3	41.0	34.9	80.7	335	170