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## Production and adaptability of Ostrich breeds in hot and humid climate of South part of Khuzestan Province in Iran

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A survey was carried out in summer season to evaluate the adaptability of two breeds of ostrich (black and blue neck breeds) in hot and wet tropical province of Khuzestan for 180 days. Six birds of black neck and six birds of blue neck (treatments), Three month old breeds were allocated in six pens with two chicks of each breed in every pen of rearing house separately. The results indicated that there were no significant differences ( $p>0.05$ ) for final live weight (68 Kg black neck and 70 Kg blue neck). Total feed consumption was 360 and 362 Kg for black and blue neck breeds, respectively. Feed conversion efficiency was not significant ( $p>0.05$ ), i.e.; 5.29 and 5.17 for black neck and blue neck respectively. During rearing the temperature (average 35°C) and humidity (average 63 percent) were recorded accurately and birds showed high stresses and panting. Mortality differences were significant ( $p<0.05$ ) and it was 33 % for black neck and 60 % for blue neck. It might be due to acute heat stresses, high humidity and therefore low feed intake. Therefore it is recommended that production of both mentioned breeds should not be done in south and south east parts of Khuzestan province which hot and wet climate from July to September, but the north and north east regions of Khuzestan which colder with low humidity weather might be suitable for production of ostrich.

**Key words:** Ostrich, Heat Stress, Performance, Iran

### Introduction

In Iran ostrich (*Struthio camelus*) production has been prevalence since about 1990, and is based on individual producers and mostly focuses on breeding and increasing the bird rather than selling them for meat consumption. The desert is the natural environment of the ostrich; however it is quite a hearty animal and wet climate. In the survive quite well being ranches in cold, moderate and tropical places with low raining (Shanawang, 1996).

This experiment was done in khuzestan province which is located in south part of Iran in hot summer with the temperature reaches up to 50°C or more,

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and in some places mostly near the sea, the humidity is about 85-95%. In Khuzestan, many crops are grown and lots of wastage. Agro industries like sugar beet and sugar cane industries are there that annually about one million tons by-products are obtained. All these by-products can be a good and cheap source of unconventional feed for ostrich nutrition, which might reduce the cost of its meat, because in poultry food comprises 60-70% of the cost of meat production, and as increasing population, providing food especially animal protein which is important for health and growth of people becoming a problem for government. Commercially ostrich production has some benefits and advantages to beef fattening. From a pair of ostrich, in a year we can fatten about 40 chicks, that with a good management each one can reach to a weight of 100-140 kg/year (Nasser *et al.*, 2005).

Moreover they have some other products such as skin, feather and oil that are of economical value. Currently, ostrich products are becoming ever more affordable, and this is extremely beneficial, because ostrich leather is considered to be of the finest and most durable in the world, as well as ostrich meat is very low in fat content as well as cholesterol. Therefore production of ostrich economically is very important and due to gaining benefits, day by day people become interested to rear this bird (Shanawang, 1996).

## **Materials and methods**

This experiment was conducted in Khuzestan province (Ahwaz city) which is located in south part of Iran and has a tropical climate, to evaluate the production and adaptability of two breeds of black and blue neck of ostrich chicks. In this trial treatments were two breeds of 6 chicks with 3 months old per each treatment, in 3 replications of two birds for every replicate.

According to breeds, chicks were placed in 12 pens separately. Standard feed was given in three periods of time, i.e. 0-3, 3-6 and 6 to 9 months old, and in each phase the amount of ingredients and chemical composition of the diet were changed according to the requirements. Different ingredients and chemical composition of diets are shown in Table 1.

**Table 1.** Ingredients (%) and chemical composition of diets

Ingredients	<i>Diets (monthly)</i>		
	0-3	3-6	6-9
Maize meal	53	45	40
Soya been meal	10	15	18
Dry alfalfa	6	20	30
Barley	10	10	13
Fish meal	7	6	5
Oyster shell	104	1.4	1.4
Dicalcium phosphate	106	1.6	1.6
Mineral	0.7	0.7	0.7
Salt	0.3	0.3	0.3
Total	100	100	100
<b>Chemical composition</b>			
Energy (Kcal/kg)	2900	2850	2800
Protein (%)	21	19	15
Methionine (%)	0.9	0.5	0.3
Lysine (%)	1.12	0.99	0.65
Calcium (%)	1.15	0.96	1.14
Avail. Phos. (%)	0.65	0.46	0.48

## Results and Discussions

The mean recorded results of the temperature and humidity in the morning, noon and evening are shown in Table 2. It noted that the rearing house equipped with cooling pads and ventilation 24 hours per day, though because the outside weather was really hot with a temperature of more than 50° C and two months along with humidity of about 90% . Here in Ahwas (Khuzestan) people are really suffering while working and without cooler that can not be alive. Anyhow, it is indicated in table 2, the highest mean temperature for morning, noon and evening per each month was for July (28, 40, 38 C respectively) with an average of 35 C/day. The mean humidity was 80, 84 and 87% in the morning, noon and evening in August respectively, with daily average of 83%.

The high temperature and humidity over all in poultry cause low appetite and feed consumption, less growth and increase mortality rate. (Tee *et al.*, 1985; Bottje and Harrison, 1985). So for rearing ostrich care should be taken to reduce humidity as much as possible. High humidity reduces the loss of evaporative heat from skin and respiratory membranes in poultry. The major problem facing ostrich in Kuwait is heat stress, which creates a great economical problem for producers (Al-Nasser *et al.*, 2005) the same results obtained in our trail. The results of final body live weight, daily weight gain

feed consumption, feed conversion efficiency, mortality percentage body height, round the body and metatarsus height of two ostrich breeds are shown in Table 3.

**Table2.**The average temperature and humidity in summer during the experiment

	Temperature (°C)			Humidity (%)		
	June	July	August	June	July	August
Morning	29	28	28	70	82	80
Noon	38	40	35	74	85	84
Evening	34	38	34	70	85	87

**Table3.** The mean comparison of different performances of two breeds of black and blue neck ostrich in hot and wet climate of khuzestan (Ahwaz center)

Different traits	Breeds	
	Black neck	Blue neck
Final body Live weight (kg)	68 <sup>a</sup>	70 <sup>a</sup>
Daily weight gain (g)	360 <sup>a</sup>	290 <sup>a</sup>
Total feed intake (kg)	360 <sup>a</sup>	362 <sup>a</sup>
Feed conversion efficiency	5.29 <sup>a</sup>	5.17 <sup>a</sup>
Mortality (%)	33 <sup>a</sup>	66 <sup>b</sup>
Body height (cm)	164 <sup>a</sup>	175 <sup>a</sup>
Behind wings (cm)	110 <sup>a</sup>	114 <sup>a</sup>
Metatarsus height (cm)	46 <sup>a</sup>	48 <sup>a</sup>

A-b the means in each row with the same superscripts are not significant ( $p>0.05$ )

It is assumed from table 3, differences were not significant ( $p>0.05$ ) for final live weight, which was 68 and 70 kg for black and blue neck ostriches respectively. These results showed that it was 18 kg below the standard weight, and similar with the results of sabbioni *et al.* (1999) that reported the body weight of ostrich breed after 9 months production was 75 kg. They described that low body weight was due to heat stress that effects on acid -base balance and osmotic pressure of body. Cornetto *et al* (2003) showed that the number of birds and stocking density effect on body weight gain and feed consumption, and if the space for production and energy of feed become adequate, the growth and performances improve.

Feed intake for black and blue breeds were 360 and 362 kg respectively and there was no significant differences ( $P>0.05$ ). The present result was not in agreement with Bensons findings. Benson *et al* (2000) reported that in moderate climate after 9 months production of ostrich, the feed consumption was 384 kg,

(about 20 kg above than our findings). It seems that hot and wet weather reduce appetite and naturally birds not consume enough food. Probably reduction of appetite is due to that ostriches no need to eat more for warming up the body, so they won't consume food with high body heat increments.

Feed conversion efficiency was high for both black and blue breeds, i.e.; 5.29 and 5.17 respectively and they did not show any significant differences ( $p>0.05$ ). Cooper (2005) reported that in poultry for reaching good conversion efficiency accurate feeding and improved management are necessary and rearing them in good climate is also effective.

Mortality percentage during the experiment was very important trait. As it is indicated in Table 3, the mortality percentage in black neck was 33% and in blue neck it was 66%. There were significant differences between two treatments ( $P<0.05$ ). The ambient temperature was 35°C and humidity of 83%. The temperature outside the house was more than 50° C with humidity of 80 to 90% in July and August which the highest mortality rate among two breeds occurred in these two months. It is reported that ostrich may tolerate high temperature, but when it is accompanied with humidity they can not stand these conditions. In summer, chicks and juveniles younger than 1 year must, of course, be well protected against bad weather (Davis, 2006). In Kuwait it is reported that the main problem facing ostrich is heat stress (Al-Nasser *et al.*, 2005).

Body height, breast and foot length (metatarsus) there were no significant differences for these three traits between treatments ( $p>0.05$ ). The black and blue breeds showed the height of 164 and 175 cm, chest round of (behind wings) 110 and 114 cm and metatarsus length of 46 and 48 cm respectively. The present result which on average showed that two breeds had 203 cm growth per week was similar to the results of Mushy *et al.* (1998).

It is concluded that the production of these two breeds in Ahwas city, which almost covers all types of weather dry hot and humid of province with high temperature and humidity in June, July and August due to heat stress, low performance and high mortality rate is not recommended, but in other months it is possible to grow them, especially black neck. It seems north part of state which has dried and colder weather in summer in comparison to south part might more suitable for production and rearing ostrich.

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