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Transportation, Adaptive and Productive Performance of Transported Buffalo Herd in New Environment

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ABSTRACT

The study was carried out in El-Nobarya Station, Beheira Governorate and El-Nataf El-Kadeem Station, Kafr El-Sheikh Governorate. Twenty-two buffalo cows were included in the experiment. Animals were transported\d to El-Nobarya station to establish a buffalo herd in this station.The experiment included two stages, the first stage aimed to study the effect of transportation and the second stage aimed to study the effect of acclimatization in El-Nobarya station. Meteorological data were collected and recorded including air temperature (AT, °C), relative humidity (RH, %) and wind speed (WS, Km/hr.), from which temperature humidity index (THI) was calculated. The following physiological and hematological parameters were recorded: rectal temperature (RT, °C), respiration rate (RR, r/min), hemoglobin (Hb, g/dl), hematocrit value (Ht, %) and differential counts of leukocyte types; Neutrophils (Ne), Lymphocytes (Ly), Eosinophils (Eo), Monocytes (Mo) and Basophils (Ba). Meanwhile productive traits included dam weight at calving (DW, KG), birth weight of calves (BW, Kg), weaning weight of calves (WW, KG), calving interval period (CI, day), lactation period (LP, day), total milk yield (TMY, Kg) and persistency (PE, %).The present work was conducted to compare between physiological and productive performance of buffaloes before and after transportation. The main obtained results are: the decrease in THI and increase in WS were the main meteorological factors affecting physiological performance for animals. The high difference between animal body temperature and house temperature in El-Nobarya had been ameliorated by the effect of low THI and high WS. Transportation influenced significantly physiological (RR and RT) and hematological parameters. It increased significantly RR, RT, Ne and Mo and decreased significantly Ht, Hb, Ly and Eo after sustainability of animals. However, productive traits of the first season after transportation was better than before transportation except TMY due to better managerial and environmental conditions. Buffaloes can acclimatized to transportation stress during the first season as no significant differences were found between physiological and productive traits between the four season after transportation except milk yield and milk curve persistency which require three seasons to come back to pre-transportation levels. It could be concluded that buffaloes under conditions in El-Nobarya were better than those in El-Nataf El-Kadeem due to better environmental conditions (lower THI and higher WS) and management.

Keywords: Buffaloes, transportation, temperature humidity index (THI), Total milk yield, Persistency

INTRODUCTION

The micro-environment around animals is mainly defined as the assembly of physical, chemical and biological factors of the air from the animal houses, these factors act concomitantly on the animal. The microenvironment is represented by climate which is a combination of humidity, rainfall, air movement, radiation, barometric pressure and ionization. While the macro-environment includes feeding, housing, water, workforce and vaccination describing management provided to the animal. Proper animal management is essential to its well-being. A good management program also provides the environment, housing, and care that permit animals to grow, mature, reproduce, and maintain good health as described by Falconer (1996).

Environmental stressors undoubtedly influence the animal's biology which can be expressed through failure to achieve its optimum production performance, or through disease and death. Stress in farm animals may also have detrimental effects on quality of its products mainly milk and meat. Farm animals try to cope with stressors using behavioral and physiological stress responses aiming to restore homeostasis. When these responses are not successful or when they are disturbed, typical behavioral and physiological symptoms of chronic stress occur as described by Moberg, (2000), Blokhuis *et. al.*, (1998) and Kassab and Hamdon (2016)

The potentiality of the buffalo to produce and reproduce under the harsh environmental conditions compared to dairy cattle has been emphasized by Marai and Habeeb (2010). Also, Omran and Fooda (2013) showed in the Egyptian buffalo that buffalo was able to maintain a good performance under environmental conditions of THI reaching 91, showing the ability of buffalo to cope with different stress factors.

Transportation is considered as a strong stress factor; however, the intensity of stress reaction following transportation has not yet been determined in buffaloes. It's usually necessary to transport farm animals at least once during their lives. During handling and transport, animals are subjected to a variety of potential stressors such as heat, cold, poor air quality, vibration and noise. Many of these factors compromise the welfare and health of the animals and also reduce meat quality and may even cause death as reported by Dantzler (1982). During transvers climatic changes in temperature, humidity seems to put more load on animals due to decreased feed intake, increased water intake and disturbing of physiological parameters reflected on growth rate, milk production, reproduction and immunity as described by Von Borell (2000). Transport animal to a new micro-environment may reflect a problematic productive. The present work was conducted to compare between buffalo productive performance before and after transport from neutral environment to another, with respect to the production, physiological and hematological reactions under the new environmental condition.

MATERIALS AND METHODES

Animals and Management:

This study was carried out in El-Nobarya Station in Beheira Governorate and El-Nataf El-Kadeem Station, Kafr El-Sheikh Governorate belonging to Animal Production Research Institute. Twenty-two female buffalos were allocated to experimental trial. Animals were transported to El-Nobarya station intended for the establishment of a new herd in this station. Parities of these

animals ranged between first, second, third and heifers in addition with two sires. The female buffalos were between 2 to 9 months of pregnancy. The productive performance of the transported animals was monitored for about three years. The experiment included two stages the first was to study the performance of the animals just before and after transportation to El-Nobarya Station from El-Nataf by investigating recorded physiological and hematological reactions, and the second was to follow up the performance of animals under the new environmental condition.

Housing of the animals in El-Nataf El-Kadeem Station involved asbestos roof and earthy land, while the nutrition, drinking basins and walls were from cement. The height of the ceiling was nearly about 4.5-5 m from land and nearly 3.0 to 3.5 m from animals. While the buffalo's house in El-Nobarya Station involved a corrugated sheet ceiling and cemented land for dairy milk and suckling, but earthy land was used for other ages. The height of the roof was nearly 2.70 m from land and 1.70 m from animals in dairy house, the height 2.30 m from animals, 2 m in the suckling house, but it was about 3.50 m from roof and 2.60m from animals in the weaning house.

Buffaloes in the current study were fed according to the Animal Production Research Institute requirements. Buffalo calves were allowed to suckle their dams from birth through the first two weeks after which, the calves are normally weaned three month and fifteen days. Weaning of the calves began gradually on starter feeds up to the time where they consumed about 2 %, from their birth weight, dry matter.

Meteorological data

The meteorological data including air temperature (AT, °C), relative humidity (RH, %), wind speed (WS, Km/hr.) were recorded monthly in both El-Nobarya and El-Nataf El-Kadeem stations during the experimental period from (July2011 to July 2014), and the temperature humidity index (THI) around the animals was calculated using equation of Mader *et. al.* (2006) as following :

$$THI = (0.8 \times T) + [(RH/100) \times (T - 14.4)] + 46.4$$

Where:

T is air temperature (˚C), RH is the relative humidity (%).

The temperature of housing, roof, land, water, nutrition basins, cement blast walls and iron pipes were recorded using scichemtech infrared thermometer, from which heat reflection from house to animals and from animals to house (in °C) was calculated.

Adaptive physiological and hematological parameters:

The adaptive physiological parameters of the animals including rectal temperature (RT, °C) and respiration rate (RR, r/min) and hematological parameters were recorded before and after transportation and monthly thereafter. Blood samples were collected in heparinized tubes from the external Jugular vein and plasma samples were used for the determination of the following hematological parameters: hemoglobin (Hb, g/dl), hematocrit value (Ht, %) and differential counts of leukocyte types; Neutrophils (Ne), Lymphocytes (Ly), Eosinophils (Eo), Monocytes (Mo) and Basophils (Ba).

Reproductive and productive performance parameters

Productive performance of the herd including birth weight of calves (BW, Kg), weaning weights of calves (WW, KG), calving interval period (CI, day), lactation period (LP, day), total milk yield (TMY, Kg), Persistency (PE, %) in addition to lactation curve were recorded in the year before transportation for the transported and non-transported groups and for three calving for the transported group.

Statistical Analysis:

Relevant statistical analysis of data was carried out using the Statistical Analysis System (SAS, 2002). Paired t test was used for testing the effect of transportation (before vs. after transportation), while Student t test was used to test the effect of location (EL-Nataf El-Kadeem vs. El-Nobarya station).

Lactation curve was described as the logarithmic gamma-type function (Wood, 1967).

$$Ln(Y_n) = Ln(a) + b\,Ln(n) - cn$$

where:

Y_n = Total weekly milk yield (kg), n= Week (s) of lactation, a= Initial milk yield (kg), b= Rate (kg/week) of increase to peak during the ascending phase and c= Rate (kg/week) of decrease during the descending phase.

$$\text{Persistency (P, \%)} = \frac{\text{(Milk yield in 28 weeks – Milk yield in first 14 weeks)}}{\text{Milk yield in first 14 weeks}} \times 100$$

RESULTS AND DISCUSSION

Meteorological data including air temperature (AT, °C), relative humidity (RH, %), Wind speed (Km/hr.) and Temperature Humidity index (THI) in Kafr El-Sheikh and El-Beheira Governorates (EL-Nataf El-Kadeem and El-Nobarya stations) during (July 2011 to July2014) are shown in Table (1). THI commonly used as an indicator of degree of climatic stress on animals (Fuquay, 1981) was slightly lower and WS slightly faster in El-Nobarya than in El-Nataf El-Kadeem. However, the mean THI was higher than 72 in both stations during the experimental period.

Table 1. Mean ± SE for air temperature (AT, °C), relative humidity (RH, %), temperature humidity index (THI) and wind speed (WS, Km/hr.) in El-Beheira and Kafr El-Sheikh governorates during the study period (2011 to 2014).

Year	Kafr El-Sheikh EL-Nataf El-Kadeem station				El-Beheira El-Nobarya station			
	AT	RH	THI	WS	AT	RH	THI	WS
2011	25.5±0.29	70.4±0.23	74.1±0.43	2.2±0.05	24.4±0.29	70.0±0.25	73.0±0.43	3.3±0.05
2012	27.0±0.30	69.7±0.25	74.8±0.86	2.4±0.05	24.9±0.30	69.2±0.27	74.0±0.45	3.4±0.05
2013	26.1±0.30	69.2±0.30	73.5±0.44	2.4±0.05	24.12±0.30	68.9±0.32	72.4±0.44	3.4±0.05
2014	28.0±0.26	70.0±0.27	74.7±0.38	2.0±0.03	25.0±0.25	69.6±0.28	73.7±0.37	3.1±0.03

Tables (2) shows the mean ± SE temperature (°C) of buffaloes' house (roof, land, wall, water and nutrition basins) and mean body temperature (°C) of buffaloes (head, neck, abdominal and back). The values of temperature gradient from house to animals indicate that house temperature was higher than body temperature by about 3 °C in milking house in El-Nobarya, while house temperature was slightly lower than body temperature (by about 1 °C) in all other houses except milking house in El-Nataf El-Kadeem where house temperature was lower than body temperature by about 7 °C. These results indicate that housing systems caused heat load on animals in both stations except milking house in El Nataf El-Kadeem station. Since, the processes of conduction convection and radiation are all dependent on thermal gradient, thus as air temperature rises towards body temperature the thermal gradient is reduced and heat dispersion is less effective, in addition the non-evaporative cooling will shift to evaporative cooling when ambient temperature equal or above body temperature as described by Khalifa (2003). This situation affects animal production adversely due to disturbances in the metabolism (increased water intake and decreased feed intake) and more activation to the normal thermoregulation (Ashour *et al*., 2000; Omran *et al*., 2013).

Table 2. Mean ± SE for temperature (°C) from house to animal and from animal to house (Milking Suckling ,Weaning) in El-Nataf El-Kadeem and El-Nobarya stations .

Items	EL-Nataf El-Kadeem			El-Nobarya		
	Milking House	Suckling House	Weaning House	Milking House	Suckling House	Weaning House
House	29.75±0.24	31.00±0.18	39.78±0.21	38.68±0.81	31.54±1.81	36.08±0.35
Animals	36.99±0.11	32.73±0.17	40.14±0.10	35.41±0.52	32.75±0.00	37.14±0.19

1- Effect of transportation:

During transportation animals are exposed to environmental stress including heat or cold, humidity, noise and motion.

1- Physiological parameters:

Table (3) shows the mean ±SE for physiological and hematological responses of female buffaloes just before (in El-Nataf El-Kadeem station) and after transportation to El-Nobarya station in July 2011. Values of RT (°C) and RR (r/min) increased significantly after transportation. It has been proved by several studies that buffaloes have low capability of sweating thus it depend on increased rate of respiration to insure enough water vaporization for proper heat dissipation. Kundu and Bhatnagar (1980) stated that RR plays an important role in thermoregulatory mechanism among all the physiological reactions and body temperature. The increase in respiration rate with the increasing temperature may be due to more demand of oxygen by the tissues in stressful condition. RT (°C) is known to be a good measure of core temperature and has been used by many investigators as a measurement to detect the response of animal to environmental conditions (Shafie and EL-Sheik Aly1970, Omran *et al.*, 2018, Omran *et al.,* 2011b, Omran and Fooda 2013) .

Table 3. Mean ± SE for physiological parameters of buffaloes before and after transportation to El-Nobarya station.

Item	Before transportation (El-Nataf El-Kadeem)	After transportation (El-Nobarya)
Rectal temperature (RT, °C)	39.4±0.05^{b}	40.0±0.02^{a}
Respiration rate (RR, r/min)	27.05±0.40^{b}	45.0±0.27^{a}

2- Hematological parameters:

Hematological parameters before and after transportation were presented in Table (4). Hematocrit (Ht, %), Hb (g/dl) and Ly decreased significantly after transportation, while the values of Ne was found to be increased significantly after transportation. The drop of Ht (%) and Hb (g/dl) may be due to reduction in oxidation activity and metabolism. The immunological reaction was fortified by increase in Ne against a decrease in Ly and increase of Mo against a decrease in Eo. The current results are in agreement with Omran *et al*. (2013) found that transport of buffalo calves from natural condition to artificial hot condition (40°C) changed their physiological performance.

Table 4. Mean ± SE for hematological parameters of buffaloes before and after transportation to El-Nobarya station.

Item	Before transportation (El-Nataf El-Kadeem)	After transportation (El-Nobarya)
Hematocrit (Ht, %)	31.00±0.00^{a}	28.53±0.19^{b}
Hemoglobin (Hb, g/dl)	12.00±0.00^{a}	10.33±0.16^{b}
Neutrophils (Ne%)	40.50±0.50^{b}	50.40±0.41^{a}
Lymphocyte (Ly%)	49.5±0.50^{a}	39.67±0.40^{b}
Eosinophils (Eo%)	4.50±0.50^{a}	4.53±0.13^{a}
Monocytes (Mo%)	5.50±0.50^{a}	5.40±0.13^{a}
Basophils (Ba%)	0.0±0.0^{a}	0.0±0.0^{a}

In the same row means with different superscripts are significantly different (P<0.05).

3- Reproductive and productive parameters:

Table (5) shows mean ±SE for dam weight at calving (DW/kg), birth weight of calves (BW/kg), weaning weight of calves (WW/kg), lactation period (LP/day), total milk yield (TMY/kg) and calving interval for female buffalo before transportation in El-Nataf El-Kadeem and same animals after transportation to in El-Nobarya station. Significant differences were recorded for all parameters except dam weight at calving. Birth weight (BW), WW, LP (significantly higher) and CI (significantly lower) were better in El-Nobarya may be due to better climatic conditions. The lower THI and faster WS in El-Nobarya station may be the main climatic factors that increased dissipation of heat load (Caulfield *et al.*, 2013) which reflected on increased feed intake and reducing stress to pregnant animals during the first season after transportation. Omran and Fooda (2013) found that increased THI caused a reduction in daily gain (DG) in the

buffalo and Friesian calves. The better climatic conditions (THI and WS) in El- Nobarya than in El-Nataf El-Kadeem stations ameliorated the higher house temperature of different housing systems in El- Nobarya than in El-Nataf El-Kadeem stations. Collier *et. al*., (2006) reported that the height of the ceiling and type of land might affect heat load from house to animal due to decreased feed consumption. However, the significantly lower TMY after transportation (Table 5) indicated that better climatic conditions in El-Nobarya did not ameliorate the effect of transportation on decreasing TMY during the first season after transportation.

Table 5. Mean ± SE of productive performance of buffaloes before and after transportation from El-Nataf El-Kadeem (2010) to El-Nobarya (2011).

Item	Before transportation (El-Nataf El-Kadeem)	After transportation (El-Nobarya)
Dam weight at calving (DW, kg)	475.0±75.00[a]	435.00±85.00[a]
Calving birth weight (BW, kg)	35.0±0.00[b]	39.57±1.32[a]
Calving weaning weight (WW, kg)	85.00±0.00[b]	90.18±1.30[a]
lactation period (LP, days)	252.03±21.8[b]	264.67±19.20[a]
Total milk yield (TMY, kg)	1184.8±99.8[a]	1174.17±77.7[b]
Calving interval (CI, days)	430.14±19.60[a]	421.00±00.0[b]

In the same row means with different superscripts are significantly different (P<0.05).

2- Effect of location:

Mean ±SE for physiological responses of transported and non-transported buffaloes during the first year after transportation are illustrated in Table (6). Both RT and RR were significantly lower in buffaloes kept in El- Nobarya than those in El-Nataf El-Kadeem stations mainly due to the better climatic conditions (THI and WS) in El- Nobarya than in El-Nataf El-Kadeem stations (Table, 1). Hahn *et al.* (2003) stated that any improved animal index will ideally be useful as a base for continued development of biologic response functions and representative of consequences resulting from primary factors influencing energy exchange between the animal and its surrounding.

Table 6. Mean ± SE of physiological parameters of buffaloes in El-Nataf El-Kadeem and El-Nobarya after acclimatization for one year from transportation.

Item	El-Nataf El-Kadeem	El-Nobarya
Rectal temperature (RT, °C)	38.5±0.05[a]	38.0 ±0.02[b]
Respiration rate (RR, r/min)	26.3±0.3[a]	22.9±0.27[b]

Also, productive traits except TMY were better in buffaloes kept in El- Nobarya than those in El-Nataf El-Kadeem stations (Table 7) may be due to better climatic and management in El- Nobarya than in El-Nataf El-Kadeem stations. Omran *et al.* (2011 a, b) found that buffalo calves with the climatic change is more adapted and any improved in feeding, housing management and employing techniques to modify environmental condition can realize alleviation of heat load on the animals during high ambient temperatures and can increase meat production from buffalo calves.

Table 7. Mean ± SE of productive performance of buffaloes in El-Nataf El-Kadeem and El-Nobarya after acclimatization for one year from transportation

Item	El-Nataf El-Kadeem	El-Nobarya
Calving birth weight (BW, kg)	36.54±0.0[b]	39.57 ±1.3[a]
Calving weaning weight (WW, kg)	87.99±0.0[b]	90.18 ±1.3[a]
lactation period (LP, days)	258.04±1.3[b]	264.67±0.20[a]
Total milk yield (TMY, kg)	1175.06±80.4[a]	1174.17±77.76[a]
Calving interval (CI, days)	435.00±13.63[a]	421.00±32.75[a]

In the same row means with different superscripts are significantly different (P<0.05).

3- Effect of acclimatization:

Mean ±SE for physiological responses, hematological parameters and reproductive and productive traits of buffaloes during the follow-up period for four years after transportation in El- Nobarya station are represented in Tables (8 to 10). No significant differences were found between the four seasons in all parameters indicating that buffaloes had been acclimatized from the first season to the new environmental conditions after transportation. This might be due to sustainability of management conditions and environmental conditions (Table 1). Collier *et al.* (2008) resulted that, the time required for acclimation varies according to tissue types, and from a few days to several weeks, for example changes in metabolism in response to heat stress occur over a few days.

Alterations in physiological responses to thermal stress was found to be within 24-48 h in the Egyptian buffaloes to allow acclimatization of the animal against severe condition under artificial condition at 40°C and 25°C (Omran, 2008).

Table 8. Mean ± SE for physiological parameters during the four years follow-up period after transportation in El-Nobarya station.

Items	2011	2012	2013	2014
RT	38.0±0.02[a]	38.2±0.02[a]	38.0±0.02[a]	38.0±0.02[a]
RR	22.9±0.27[a]	23.2±0.27[a]	22.4±0.27[a]	22.4±0.27[a]

In the same row means with different superscripts are significantly different (P<0.05).

Table 9. Mean ± SE for hematological parameters during the four years follow-up period after transportation in El-Nobarya station.

Items	2011	2012	2013	2014
Ht	32.14±0.26[a]	33.86±0.55[a]	33.85±0.71b[a]	34.23±0.61[a]
Hb	12.57±0.43[a]	12.64±0.34[a]	12.85±0.41[a]	13.38±0.33[a]
Ne	41.57±1.00[a]	41.50±1.27[a]	40.54±1.78b[a]	41.08±1.38[a]
Ly	49.86±1.24[a]	50.21±1.47[a]	50.31±1.89[a]	49.46±3.93[a]
Eo	4.43±0.20[a]	4.00±0.23[a]	4.16±0.21[a]	4.38±0.24[a]
Mo	4.14±0.34[a]	4.50±0.17[a]	4.0±0.22[a]	4.08±0.21[a]
Ba	-	-	1.00±0.00	1.00±0.00

In the same row means with different superscripts are significantly different (P<0.05).

Table 10. Mean ± SE for productive parameters during the four years follow-up period after transportation in El-Nobarya station.

Items	2011	2012	2013	2014
BW	39.57±1.32[a]	38.43±1.60[a]	38.54±1.63[a]	36.19±1.58[a]
WW	90.18± 1.3[a]	88.83±2.43[a]	90.33±1.62[a]	87.00±3.09[a]
LP	264.67±19.20[a]	226.69±23.41[a]	216.83±22.59[a]	207.40±19.97[a]
TMY	1174.17±77.76[ba]	1058.00±123.59[b]	1093.00±120.33[ba]	1277.40±120.02[a]
CI	421.00±32.75[a]	409.43±29.73[a]	397.50±15.12[a]	403.50±38.86[a]

In the same row means with different superscripts are significantly different (P<0.05

Estimates of the parameters of the Wood's model (a, b and c, Kg) and persistency (PE, %) for total milk yield for buffaloes in El-Nobarya and El-Nataf El-Kadeem stations at different parities are shown in Tables (11 and 12). These results indicated that, in El-Nobarya the initial of milk yield (a) values were high for parity 2 compared with other parities.

Table 11. Estimates of the parameters of the Wood's model (a, b and c, Kg) and Persistency (PE, %) for total milk yield for female buffaloes transported to El-Nobarya farm in different parities.

Parity	a (kg)	b (kg)	c (kg)	PE (%)
1	39.3	0.14	-0.03	79.5
2	49.4	0.03	-0.02	67.2
3	47.5	0.05	-0.02	78.2

Table 12. Estimates of the parameters of the Wood's model (a, b and c, Kg) and Persistency (PE, %) for total milk yield for female buffaloes kept in El-Nataf El-Kadeem farms in different parities.

Parity	a (kg)	b (kg)	c (kg)	PE (%)
1	15.6	0.72	-0.08	83.6
2	15.6	1.072	-0.13	76.6
3	22.0	1.22	-0.16	57.0

Whereas, the ascending phase (b) values were high for parity 1 compared with other parities but the descending phase (c) had almost the same value. The persistency values were 79.5, 67.2 and 78.2 % for P1, P2 and P3, respectively. And in El-Nataf El-Kadeem the initial of milk yield (a) and the ascending phase (b) values were high for parity 3 compared with other parities. Whereas, the descending phase (c) values were high for parity 1 compared with other parities. The persistency values were 83.6, 76.6 and 57.0 % for P1, P2 and P3, respectively. It could be notice that persistency was better in El-Nobarya than in El-Nataf El-Kadeem stations in the third parity indicating that acclimatization for three seasons required for milk curve persistency in buffaloes.

The lactation curve for the three parities in El-Nobarya and El-Nataf El-Kadeem stations are represented in Figs. (1 and 2). The lactation curve for P1 and P3 takes almost normal shape compared with P2 in El-Nobarya station. Whereas in El-Nataf El-Kadeem station, the lactation curve for three parities takes normal shape. This results may be due to the differ of management between the two stations.

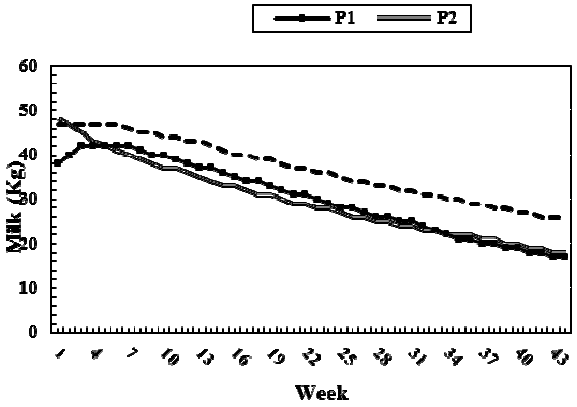

Fig. 1. Lactation curves in El-Nobarya at different parities after transportation

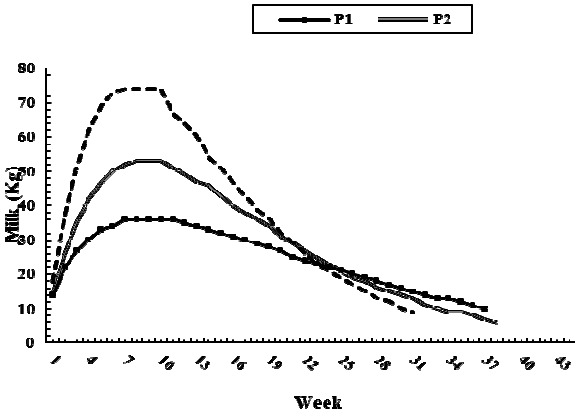

Fig. 2. Lactation curves in El-Nataf El-Kadeem at different parities

CONCLUSION

Transportation affects greatly physiological and hematological traits of buffaloes, however, environmental conditions and managerial factors are the main factors affecting their reproductive and productive traits. Buffaloes can acclimatize to transportation stress during the first year after transportation but need to three seasons to be acclimatized regarding total milk yield and curve of lactation. It is recommended to offer good manage and environmental conditions to ameliorate the effect of transportation on pregnant buffaloes. The managerial and environmental conditions in El-Nobarya are better than that in El-Nataf El-Kadeem except housing system which requires further studies.

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النقل والتآقلم والآداء الانتاجي لقطيع جاموس منتقل إلي بيئة جديدة

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أجريت التجربة في محطتي النوبارية بمحافظة البحيرة والنطاف القديم بمحافظة كفر الشيخ وهما يتبعان معهد بحوث الانتاج الحيواني، مركز البحوث الزراعية، وزارة الزراعة. كان متاح لهذه التجربة ٢٢ جاموسة لتكوين قطيع من الجاموس فى محطه النوباريه . التجربة كانت علي مرحلتين المرحلة الأولي: دراسة تأثير النقل، المرحلة الثانية دراسة التأقلم في محطة النوبارية. وتم تسجيل البيانات التالية: درجة حرارة الهواء (درجة مئوية) ،الرطوبة النسبية (%)، سرعة الرياح (كيلو متر في الساعة). وحساب دليل الحرارة والرطوبة وكذلك تسجيل درجة حرارة المستقيم ومعدل التنفس والاستجابة لهيماتولوجي الدم، بالاضافة الي وزن الام عند الولادة، وزن الميلاد للعجل ووزن الفطام (كجم) والفترة بين الولادتين، ومدة الحليب (يوم)، إنتاج اللبن الكلي (كجم) وحساب المثابرة (%). في هذا العمل يتم المقارنة بين الآداء الفسيولوجي والإنتاجي للجاموس قبل وبعد النقل تحت ظروف بيئة متشابه تقريباً.من أهم النتائج إنخفاض دليل الحرارة والرطوبة وزيادة في سرعة الرياح هي العامل الرئيسي للتأثير علي الأداء الفسيولوجي للحيوانات. الاختلاف الكبير بين درجة حرارة جسم الحيوان والمسكن في النوبارية راجع لتحسن دليل الحرارة والرطوبة وسرعة الرياح.ظهر تأثير النقل معنوي علي معدل التنفس، درجة حرارة المستقيم وهيماتولوجي الدم. وحدثت زيادة معنوية فى كلا من (معدل التنفس ودرجة حرارة المستقيم ونيتروفيلس والمونوسيت) في المقابل انخفاض معنوي في الهيماتوكريت، الهيموجلوبين ولينفوسيت والايزانوفيلس. بعد استقرار الحيوان كانت جميع العناصر المدروسة في الموسم الاول بعد النقل أفضل مقارنة بقبل النقل فيما عدا كمية اللبن الكلية وهذا ربما راجع الي تحسن الرعاية والظروف البيئية.الخلاصه : الجاموس يمكن أن يتآقلم بعد إجهاد النقل خلال الموسم الأول ولايوجد اختلافات معنوية بين الصفات الفسيولوجية والانتاجية خلال المواسم الاربعة بعد النقل فيما عدا انتاج اللبن الكلي والمثابرة التى احتاجت الي ثلاث مواسم للعودة لمستوي ما قبل النقل. الجاموس تحت ظروف النوبارية كان أفضل عن النطاف القديم وهذا راجع لظروف البيئة الأفضل لانخفاض دليل الحراره والرطوبة وسرعة الرياح .