



## Management practices and production performance of camels under organized farming in Abu Dhabi Emirate, United Arab Emirates

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### ABSTRACT

There is dearth of systematic studies describing the husbandry aspects and production performance of camels reared under confined farming. In this context, present study was carried out focusing 35 farm units, randomly selected from Al Wafea cluster farms, over a period of one month. Data were recorded through observation of farm activities and interview cum discussion with farm personnel and analyzed for summarizing the major findings. Different species of animals reared in the farms studied were mainly sheep and goats (90.88%), followed by camels (7.09%), cattle (1.97%) and others (0.06%). Male camels were present in most of the farms and the sex ratio was 1:13. Males above 10 years were only 13.33% indicating adequate replacement of breeding males. Types of camels were mostly Hazmi and Omani being reared in 73.33% and 66.66% of the farms respectively.

Management system was semi-intensive with well-constructed houses in 80% farms, provided with a small roofed area and spacious open area. Body condition of the camels were good or fair in 93.33% farms reflecting optimum feeding and healthcare measures. However, reproductive rate was low with inter calving interval exceeding 3 years and there was 27% mortality among camel calves, which is considered one of the major drawback even in organized farming. Purpose of rearing mentioned was milk production by 93.33% of the informants. However, only 34.36% of the recently calved females were in milk with an average yield of 2.12 litres/day. Only young males were slaughtered for meat and number slaughtered in one year was only 4.45% of the total number of camels. Neither milk nor camels as such were sold as a source of income from any of the farms studied. Also there was little concern about the cost of production and is attributed to the enormous government support. Owing to sound financial position of owners, animal production is not considered a major occupation in this region. Transformation of traditional rearing into organized farming made camel production more cost oriented, but there is little effort for increasing productivity of camels or cost effectiveness of production. It is concluded that even though large number of camels are being reared under organized farming, their contribution to income and food production is very limited. However, there is considerable scope for increasing productivity of camels under organized farming utilizing the available facilities through basic level management interventions.

**Key words:** Camel, Husbandry, Meat, Milk, Reproduction, Semi-intensive

Camels were indispensable part of human habitation in deserts since ancient times, mainly as a means of transportation, draft power, and also as a source of valuable food products and protective items (Umaru and Bello 2013). In recent times, advancement of transport facilities and changes in the occupational activities has resulted in shifting economic significance of camels (El Mahi 2012) primarily into food production and leisure events such as racing, shows and safari (Lu *et al.* 2012). For the same reason, population of camels has not shown any decrease worldwide and even increased in many countries more than other livestock species (Faye and Bonnet 2012).

Traditional system of rearing camels involved free

grazing with temporary holdings scattered in the desert with frequent shifting of the herd from place to place (Shuiep *et al.* 2012). However, increasing focus on food production together with altered priorities of land utilization, urbanization and concern of deforestation caused by open grazing (El Mahi 2012, Lu *et al.* 2012) has initiated steps for intensive or semi intensive system of rearing animals including camels (Shuiep *et al.* 2012). Accordingly, many traditional camel rearing units (Ezab) within the Abu Dhabi emirate has been transformed into organized farms with stationed facilities for intensive or semi intensive systems of management (Faye 2008) as in the case of other livestock species.

Assessing the performance of camels under the altered system of rearing and initiation of new development programs demands reliable information on husbandry practices, production performance and ongoing interventions for enhancement of productivity. However,

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organized farming of camels in large number being a recent development (Previti *et al.* 2016, Shuiep *et al.* 2012), there is scarcity of studies describing the nature of production and determinants of animal productivity in such situations (Faye and Bonnet 2012). In this respect, a preliminary study involving habitat observation cum survey was conducted in selected units of Al Wafea farming cluster, intended to collect basic information on characteristics of the production systems, husbandry practices and productivity of camels under the prevailing management.

#### MATERIALS AND METHODS

The study was conducted visiting 35 units of Al Wafea cluster having a total of 320 farms, located 70 KMs away from Abu Dhabi. The farms were selected randomly and data collection was carried out during 4 weeks of June–July period. The farm visits were made by the first investigator for observation of farming practices and to collect more information on farming activities through interview and discussion with the farm personnel. Information asked for included stock details, routine management practices and major happenings in the recent past observing a recall period of 6 months. The reliability of information shared was verified through repeated questioning on certain aspects at different points of time, wherever found necessary. Also informants having less than 1 year experience in the same farm was not considered.

The data were recorded using pre-structured recording sheets prepared for the purpose and analyzed using excel sheets for descriptive details and interpretation of the findings.

#### RESULTS AND DISCUSSION

Informants of the study were caretakers of the animals in 100% of the farms since owners could not be met at the time of visit. Altogether there were 8866 animals in 35 farms studied and population share of camel was 7.09%, while small ruminants, cattle and others constituted 90.88%, 1.97%, and 0.06% respectively. However, traditional holdings in this region is reported to have slightly higher proportion of camels (10.63%) and lesser small ruminants (88.61%) (Livestock Census 2013). This in turn indicates lesser preference for camels in this particular farm cluster and it is known that there exists marked variation in the animal preferences between different clusters.

Irrespective of the type of holdings, proportion of camels appeared very less compared to the huge number of small ruminants. In this respect, simple comparison between the numbers of large and small animals does not make sense. Camel being a large animal, 629 heads in 35 farms is something big, indicating relative significance of camels in the region and is further highlighted by the high proportion of camels among large animals in the farms studied (camels formed 72% more than the number of cattle).

Among the 35 farm units studied, camels were present in 21 (60%) farms, which included 4 (11.43%) units rearing

camels alone and the rest were having camels together with other animals. Collection of husbandry information was restricted to 15 (42.86%) farms having at least 10 camels. Number of camels in each farm ranged from 11 to 84 (mean 30) and adult females alone ranged from 5 to 54, which was less than the number under traditional rearing (Benaissa *et al.* 2012), and more than the herd size of organized farms (Shuiep *et al.* 2012) reported from other countries. Numbers of total camels and adult females in the four farms rearing exclusively camels are shown in Fig. 1.

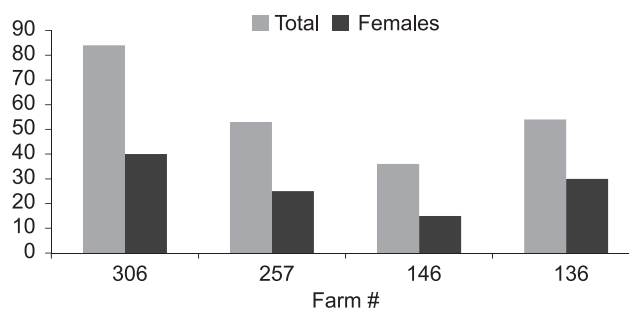


Fig. 1. Total number and adult females in farms rearing only camels.

Camels reared were mentioned as milch type in 93.33% farms, and proportion of farms maintaining different breeds such as Omani, Hazmi, Sudani and Pakisthani were 66.67%, 73.33%, 6.67% and 6.67% respectively.

Management system was semi intensive in all the farms with inhouse feeding and watering facilities. Camel shelters were well built in 80% farms with a small roofed area and spacious open area. Roofed area was found to be adequate in 93.33% farms. Camels were sent out for open grazing in the desert occasionally from 86.67% of the farms studied. Correspondingly, cleanliness of the camel pens were good in 86.67% and considered fair in 13.33% farms. Fences and gates of the pens were also well built in 73.33% farms. Males were tethered in 40% of the farms, while let loose in individual enclosures in rest of the farms. In few of the farms, male camels were tethered in paddocks without any roof cover, exposing to the extreme sunlight of summer months.

Feed and water troughs were observed adequate and drinking water available in the troughs were clean and wholesome, in contrast to the extreme difficulty of ensuring adequate drinking water under traditional management (Aboul-Naga *et al.* 2012). Water troughs were provided with shades only in 20% farms for keeping water cool and no other cooling provisions were provided in any of the farms since camels survive harsh climates very well.

General management of the camels were judged as good in 66.67% farms and fair in 33.33% farms based on appearance of the farm premises and the animals. Body condition of the camels were assessed Good, fair and poor in 53.33, 40 and 6.67% of the farms respectively mainly reflecting the adequacy of feeding and healthcare measures. Items fed to camels in the farms studied are summarized in

Fig. 2. Government supply centers formed major source for feeding materials for all the farms (93.33%) and availability of feeding items was reported adequate by 80% informants. This was in contrast to extreme scarcity of feeding materials and high cost being reported as the major constraint for camel production in other countries (Traore *et al.* 2014 and Bakheit *et al.* 2008a).

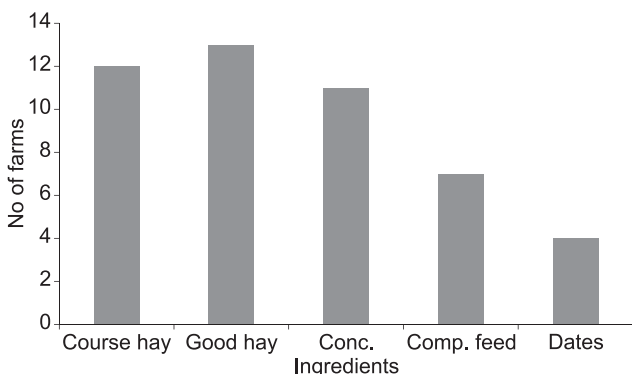


Fig. 2. Comparison of items fed to camels in the farms studied.

A total of 28 breeding males were present among the camels distributed in 11 farms making an average of more than 2 per farm. Four farms were without adult males and breeding of females in these farms were done by the males of neighboring farms, while females of one farm were also taken for breeding by elite males available at sheikhs' herd. Out of 28 males, 4 were more than 10 years of age and the remaining 85.71% were young males of 5–10 years indicating adequate replacement of breeding males. In addition to adult males, there were 21 young males of less than 5 years intended for future replacements, but taking part in breeding to some extent (Al-Qarawi 2005).

Proportionate composition of camel herds is shown in Fig. 3. Total number of deliveries reported in the previous 12 months period was 145 among 326 adult females, which

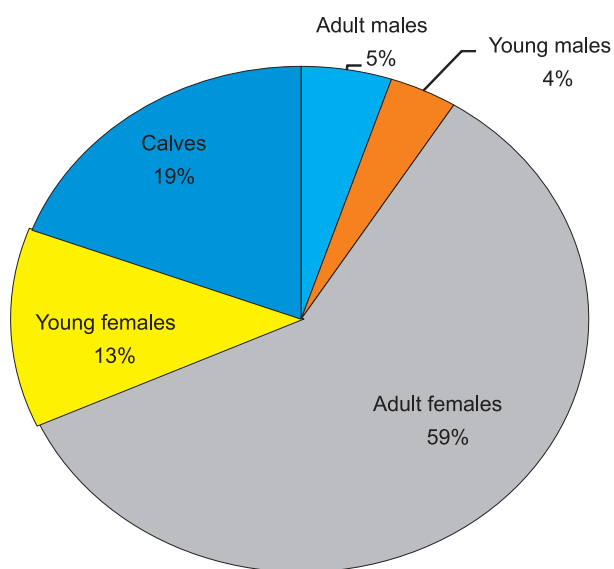


Fig. 3. Proportionate composition of camel herds.

was much better than the inter calving interval reported under traditional management (Bakheit *et al.* 2008b). However, there were 38 maiden females of more than 5 years and 69 between 1 and 5 years of age. Expecting around 45 deliveries each year among young females, remaining 100 deliveries from 326 adult females makes a calving rate of one delivery in more than three years, which is very low compared to the calving rate expected under intensive management and adequacy of feeding (Bakheit *et al.* 2012, Nagy and Juhasz 2008).

Averages of figures reported for age at first calving and interval between two successive calvings were 4.5 and 2 years respectively. However, such a performance was not achieved in most of the farms under the study as reported by Ibrahim (2008). Factors contributing to herd changes in the 15 farms studied are shown in Fig. 4. Majority of deaths (86.84%) were reported among calves, caused by various diseases. Out of 145 calves born, 39 (26.90%) died during the last one year period indicating high proportion of calf mortality. However, calf mortality exceeding 65% was reported under traditional management (Ahmad *et al.* 2012, Benaissa *et al.* 2012) and there was considerable improvement of calf survival under organized farming attributable to better feeding. Death of calves early during the lactation was reported to lower the inter-calving period in agreement with Skidmore (2011), which in turn act to compensate for the unavoidable calf loss happened.

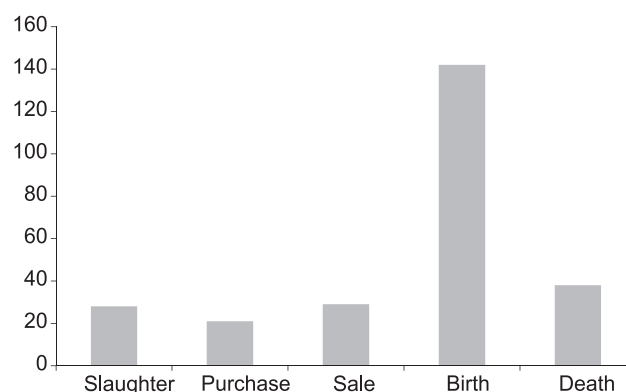


Fig. 4. Factors contributing dynamics of the camel herd.

Treatment of sick camels by veterinarian was reported in 8 farms and in others traditional treatments were tried as reported by Traore *et al.* (2014), or no treatments could be attempted since affected animals died soon after or before noticing them sick. Major healthcare measures adopted for camels were ectoparasite control sprays (100%), micronutrient supplementation in the form of mineral blocks (86.66%) and feeding deworming drugs (33.33%). No practice of vaccinations were reported for camels in any of the farms.

*Purpose of production*

Almost all the informants (93%) mentioned milk production as the primary purpose of rearing camels followed by meat (60%) and race/show purpose (26.67%).

In 14 farms out of 15 studied, milking camels were available ranging from 2–22 (average of 7.47 per farm) and the total number of milking camels was 112. Total of daily milk production was 271 litres with contribution of individual farms ranging from 3 to 100 litres and 0.6 to 5 litres per camels, which is much less than the daily production reported by Nagy *et al.* (2013). However, there is chance for more increased production with the existing management as reported by Bakheit *et al.* (2008b).

Major share of the reported milk production was from 3 farms having 12, 20 and 22 milking camels each and yielding daily 30, 100 and 50 litres respectively. In all other farms, total milk production was less than 20 litres and camels in milk did not exceed 10 heads. Milk was not sold from any of the farms since sale of camel milk was not considered as an acceptable practice as reported by Benaissa *et al.* (2012). Entire quantity of milk collected from 14 farms was taken for usage at their owners' house and neighborhood households, except some quantity used by the farm workers in 3 of the farms.

Fifteen camels belonging to one of the farm was taken for race events and one of them had won prize in the past and is being used for breeding in order to get more progenies with race potential. Regarding meat production, slaughter of young males was reported in 9 farms. Females, either young or adult were not slaughtered in any of the farms studied. A total 28 animals were slaughtered in the past one year period with a mean figure of 3.11 in each farm involved. Even with involvement of high cost of rearing, meager contribution of camels in the form of milk and meat indicate that the primary purpose of camel production in this region is not food production, unlike what is mentioned by most of the informants.

It was understood that overall management of camels was much better compared to small ruminants and cattle in the study location, indicated by well built houses in majority of the farms, better feeding regime, satisfactory body condition, adequate replacement of male animals, controlled breeding and average reproductive rate. However, productivity and return from camels was very low since lack of sale, limited slaughter, poor milk yield and high mortality rate. Thus, there exists a special situation of rearing camels in this locality, neither being an activity for income generation nor major contribution of food items and least concern about the cost of production. This is in contrary to the reports from other countries (Aboul-Naga *et al.* 2012) and the obvious reason appears to be the fact that major share of expenditure for farm establishment and maintenance are obtained through government support and owners themselves do not consider farming as a primary occupation.

Even though large numbers of camels are being reared in the farms studied, the productivity performance in terms of yield of meat and milk, reproductive rate and survival of young one appears very poor. Even though racing was expressed as one of the major purpose of camel rearing, actual involvement in racing from the farms studied was

also less. However, with existing facilities such as adequate supply of feeding materials, infrastructure, skilled work force and health care facilities there is considerable scope for improvement of camel productivity through basic level management interventions.

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