

CHAPTER 3

PROBLEMS OF REPRODUCTION

B. Musa and H. Merkt

The problems of reproduction in the camel are not extensively investigated as for example in the bovine. The information collected on these problems is derived mainly from questioning the camel owners, slaughterhouse material and very limited clinical and farm observations.

3.1 Early embryonic mortality

The incidence of early embryonic death seems to be high in the camel. It was found that twinning occurs in about 0.4 percent of 491 single births reported by Musa & Abu Sineina (1976 a). In the same study two and three corpora lutea were found in 13.65 percent and 1.22 percent respectively. The reason for these high prenatal losses is still open for more investigation (see 1.6.10). Yagil (1985) claims that one of the causes of foetal death is the strong inbreeding in the herds.

3.2 Reproductive diseases

3.2.1 Abortion and stillbirth

These are known to occur in camels. The incidence of brucellosis in camels in different countries is given in Table 3. It seems to be related to breeding and husbandry practices.

In Africa Brucella melitensis was found to be the causative agent while in the USSR the infection was found to be due to Br. abortus.

The organisms were isolated in the different countries with variable incidence of success.

It is claimed that young camels are resistant up to the age of 11 months and that they contract the disease from the dams on subsequent calving. If this is the case, then separation of young camels at 7 to 8 months of age from positive dams might help in the control programme (Higgins, 1986).

The role played by brucellosis in the overall picture of abortion in camels is not quantified. It appears that other important endemic diseases play a significant role in the overall incidence of abortion.

Trypanosomiasis leading to general debility and abortion is an important disease. Pasteurellosis and salmonellosis are also considered as causes of abortion in camels. Other causes of abortion include febrile conditions such as pneumonia and camel pox, or nervous excitement (Mukasa-Mugerwa, 1981).

Table 3: Incidence of brucellosis in camel populations in different countries (after Higgins, 1986)

Country	Infection Rate percent
USSR	15.0
Chad	3.8
Ethiopia	5.5
Egypt	10.3 - 26.0
Sudan	1.75 - 5.75
North-Eastern Kenya	14.0
Nigeria	1.0
India	1.8
Tunisia	3.8 - 5.8

3.2.2. Diseases of the female reproductive tract

Examination of abattoir material provided some information about some of the diseases that could be encountered in the reproductive tract. Although this could be considered as biased information when referring to populations of camels in general, it could however provide useful information about the existence of these diseases.

These diseases include: pyometra, bursal and ovarian adhesions, endometritis associated with a partially involuted uterus, and cystic ovarian degeneration (Mukasa-Mugerwa, 1981).

3.3 Dystocia

The incidence of camel dystocia appears to be very low (Arthur et al., 1985 a). The foetal component of dystocia includes: carpal flexion, lateral deviation of the head and hock and hip flexion. Posterior presentation is uncommon. Foetopelvic disproportion, monstrosities and transverse presentations are rare.

On the maternal side, uterine inertia occurs to a small extent.

In dealing with dystocia in the camel it was found that head and limb extension is more difficult to achieve than in the cow. However, the camel foetus survives dystocia better than the equine foetus and the camel is a good subject for caesarean section. Also foetotomy using Thyngsen's embryotome is possible when necessary.

Caesarean section could be performed on the left flank using xylazine sedation and local regional or infiltration anaesthesia.

A camel, 17 hours in dystocia, delivered a live foetus by caesarean section (Arthur et al., 1985 a).

3.4 Vaginal prolapse

This is seen clinically in pregnant camels that were well fed with limited exercise. In most of the cases it does not interfere with the pregnancy in question. The condition could be treated successfully by the Bühler technique (Arthur et al., 1985 a).

3.5 Other problems of reproduction

The fertility is defined as the ability of the male and female to produce viable germ cells, mate and conceive and subsequently give birth to living young (Mukasa-Mugerwa, 1981).

A significant aid to establish precise figures for fertility is record keeping and good management. Unfortunately both are missing under traditional camel raising systems.

Existing information indicates that fertility is unlikely to be higher than 50 percent in pastoral herds and that under improved ranch conditions it could be up to 65 percent (Mukasa-Mugerwa, 1981).

In Saudi Arabia Arthur et al. (1985 b) reported a 80 - 90 percent fertility rate and that sterility is about 1 percent. Yagil (1985) observed up to 100 percent fertility. Poor nutrition and poor grazing are a cause of reduced sexual activity in both females and males.

Debilitating diseases such as trypanosomiasis, tuberculosis, mange, pleuropneumonia and heavy parasitism all compromise the fertility rate in the camel.

Endocrine factors including insufficient gonadotropins to enhance follicular development and subsequent ovulation may also contribute to fertility rate in camels.

Concerning the bacterial flora of the female genitalia in the camel, Zaki & Mousa (1965) isolated corynebact., anthrocooids, micrococci, sarcina, gaffkya and gram negative becilli from the normal genital tract of pregnant and non-pregnant slaughtered animals. Almost the same spectrum of germs was found by Eidarous et al., (1983), however including E. coli and Staph. epidermidis.

Nawito (1973) recorded the bacteriological findings in the uteri of 2075 one-humped camels of unknown history from the Cairo abattoir. In 94 cases (4.53 percent) clinical symptoms such as asbcesses in the uterus, catarrhal endometritis, haemorrhagic endometritis, pyometra and pyometra with macerated foeti were found. Micrococcus pyogenes var. aureus played the predominant role. Furthermore, Micrococcus pyogenes var. albus, beta-haemolytic streptococci, E. coli and Pseudomonas aeruginosa could be isolated from the uteri of animals with clinical symptoms.

3.6 Reproductive problems in the male

There is very little information on reproductive problems in the male camel.

Phimosis, paraphimosis, orchitis and testicular hypoplasia were clinically observed.

Abdel-Raouf (1965) described a case of bilateral testicular hypoplasia in a dromedary. The seminiferous tubules were divided into four types according to the degree of development. Microscopic examination revealed that the smaller left testicle contained a larger number of underdeveloped tubules than the right one.

Burgemeister (1974) observed a high incidence of incest breeding in camel herds in Tunisia. It is well known that inbreeding can cause alterations in the male genital tract such as hypoplasia.

We found cases of unilateral cryptorchidism both in a live animal and in material from abattoirs (Fig. 3, 4). Furthermore, a case of subfertility was found due to pronounced asthenozoospermia in the semen of a male camel with normally developed and clinically healthy testicles.

Shawki et al. (1983) reported the incidence of filariasis among Egyptian camels to be 5 percent. The histological changes of both the testis and epididymis affected with filariasis reveal fibrosis of the tunica albuginea. The consistency of the compromised testis was soft with areas of hardness. There were degenerative changes and necrosis of the seminiferous tubules and epididymal ductus. The arterioles were thickened, dilated and engorged with microfilaria. These pathological changes were due to occlusion of the arteries and arterioles with larvae, thus reducing circulation to the testis and the epididymis. Such conditions may induce sterility in camels.

With regard to the age, the minimal incidence of testicular degeneration (10.9 percent) was found between the age of 4 - 6 years, while the maximum values (50 percent) were present in senile camels over 20 years of age. Marked decline in the blood levels of thyroxine, carotene and vitamin A were found in camels with moderate and advanced testicular degenerations. Hemeida et al. (1985 b) mentioned that there were different degrees of testicular degenerations. These changes exert a profound influence on the sperm production rate. Other testicular abnormalities mentioned by Hemeida et al. (1985 c) were: testicular hypoplasia (1.6 percent), cryptorchidism (0.7 percent), orchitis (2.3 percent), necrosis (0.7 percent), hydrocele (0.7 percent) and seminoma (0.3 percent). Filarial orchitis and funiculitis due to *dipetalonema evansi* was the most common abnormality (7.7 percent).

The bacterial flora of the male and female genital system of the camel has been examined by Eidarous et al. (1983). They found that *Staph. epidermidis*, *anthracoids*, *E. coli*, *micrococci* and *Gaffkya* were the most prevalent bacteria in the male genital tract. The prepuce and urethra were the organs most inhabited by microflora. *Staph. aureus*, *B. proteus*, *Pseudomonas aeruginosa*, *C. bovis* and *streptococci* were isolated only from the prepuce. The percentage of male genitalia in which no microbes were found was about 42 percent.

CHAPTER 4

RESEARCH NEEDS FOR IMPROVING CAMEL PRODUCTIVITY

B. Musa and H. Merkt

4.1 Improvement of low fertility rates

The low fertility rates in camels constitute an obstacle in camel reproduction and hence in camel production. In order to increase offtake rate in any population of camels, one has to improve the fertility rate in that population. Such an improvement may be necessary to convince camel owners to trade young camels which might then be conditioned for better meat quality (see 3.1).

4.2 Development of an artificial insemination system

Research to develop such a system is necessary to improve on the breeding of the animal. Males could then be selected for meat qualities, milk, riding or baggage requirements. The system will speed up improvement and will help to improve management systems and in turn will feed back to improve the fertility rates. Many questions remain open such as semen collection methods, handling of the semen, development of suitable extenders, deep-freezing, etc. Yagil (1985) points out that the selection of camels, e.g. for milk production, is difficult due to the fact that they are later maturers. Choosing the best male would mean that he would be at least 14 years old before adequate data on his daughters' performance could be received. However, by 15 to 20 years of age reproductive potential declines (see 4.2.1). Long-term storage of semen could be the solution to the problem.

Time, place and semen doses for insemination are other items for future investigations.

4.3 Nutrition and reproduction

It appears that the reproductive performance in both male and female camels is dependent to some extent on the level and quality of nutrition. The nutritional components which are directly involved in this are still not clearly identified.

Research in this area is lacking in spite of the fact that its significance is felt by various investigators in camel reproduction.

4.4 Ecology and reproduction

Studies in ecology are badly needed to investigate the magnitude of reproductive problems under the existing management systems. This would help in suggesting practical alternatives that could be adopted under pastoral and/or ranch/farm conditions. Deeper understanding of camel/owner relationships is necessary for any future improvement plans for productivity. Also, such studies would throw light on existing economics

involved with camels and from the biomass contributed from camels determined strategies for reasonable offtake rates could be worked out.

4.5 Diseases and reproduction

The role of various endemic diseases and especially parasitism in compromising the reproductive process is still not quantified. Heavy parasitism for example is known to compromise productivity and reproduction, but the real losses in terms of figures are still not known. Mange, on the other hand, is a serious disease in camels and great losses are encountered as far as the productivity of hair and hides are concerned, beside having a non-quantified negative affect on reproductive performance.

4.6 Record keeping

Record keeping and reliable statistics of all reproductive problems are basic needs for any future research (Burgemeister, 1974, 1975).

4.7 Embryo transfer

This may be of interest in the near future.