

## THE EFFECT OF HETEROSEXUAL CONTACT ON LIBIDO AND MATING DEXTERITY IN KARAKUL RAMS

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Receipt of MS 26.7.74

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**OPSOMMING:** DIE EFFEK VAN HETEROSEKSUELE GESLAGSVERMENGING OP LIBIDO EN DEKBEHENDIGHEID BY KARAKOEL-RAMME

Karakoel ramlammers is na speen in drie groepe verdeel en soos volg behandel: Groep A: Totaal geïsoleer van ooie; Groep B: By ooie vanaf speen tot 9 maande en daarna geïsoleer; Groep C: Geïsoleer van ooie tot 9 maande en daarna by ooie. Op 18 maande ouderdom is die ramme ingekraal en paarsgewys getoets by 'n bronstige ooi ten einde 'n rangorde van libido te bepaal. Daarna is elke ram vir 10 minute en met 5 herhalings by 'n bronstige ooi in 'n 3 x 3 m kraal gebring ten einde libido, dekbeheindigheid en die tyd tot kopolasie asook totale kopolasie te noteer. Die ramme wat vir die hele periode van ooie geïsoleer was het in alle opsigte die swakste gevaar en slegs 44% teenoor die 88 en 100%, respektiewelik in Groepe B & C, het enigsins in die ooie belang gestel. In geval van die groep C ramme is verder waargeneem dat hulle groeitempo aansienlik toegeneem het na introduksie van ooie op 9 maande. Die moontlikheid dat geslagvermenging 'n verhoogde testosteroon en/of groei-hormoonafskieding tot gevolg kon gehad het, is genoem. Die gevolgtrekking is gemaak dat isolasie van ramme na speen ongewens is en dat heteroseksuele geslagsvermenging voor of na puberteit van groot praktiese belang mag wees. 'n Eenvoudige toets vir libido mag ook bydra om afwykende ramme op 'n vroeë stadium op te spoor en uit te skakel.

### SUMMARY

Karakul ram lambs were divided into three groups after weaning and treated as follows: Group A: Total isolation; Group B: Contact with ewes until 9 months and then isolated; Group C: Isolated from ewes until 9 months and then allowed contact. At 18 months the rams were penned and then tested in pairs on oestrous ewes to establish a rank order for libido. Subsequently all rams were introduced individually for 10 minutes in a sequence of 5 replications to oestrous ewes in a 3 x 3 m pen. Libido, mating dexterity as well as the time lapse to first copulation and total copulations were recorded. Totally isolated rams reacted poorly and only 44% compared with 88 and 100% respectively of the rams in Groups B & C showed normal mating behaviour. Rams in Group C experienced a growth surge after introduction of ewes at 9 months of age and the possibilities of sexual contact resulting in greater testosterone and/or growth hormone release, is discussed. It was concluded that the practice of isolation of ram lambs after weaning is detrimental to normal sexual behaviour and that hetero-sexual contact prior or subsequent to puberty could be of practical importance. A simple libido test to eliminate sexually inhibited rams at an early stage is recommended.

The literature on sexual behaviour of rams has been comprehensively reviewed by Pretorius (1972). Reports from overseas (Banks, 1964; Hulet, 1966; Dýrmundsson & Lees, 1972) and South Africa (Marincowitz, Pretorius & Herbst, 1966; Pretorius, 1967) indicate that it is not uncommon for rams previously reared in isolation of ewes to become sexually inhibited and/or inactive for certain periods after being introduced to oestrous ewes. According to Kagen & Beach (1953), heterosexual contact at a relatively early stage of development is important for normal sexual behaviour and Banks (1964) and Pretorius (1967) concluded that the puberal phase is of special importance. However, no data on the effects of isolation of rams during different stages of sexual development on adult behaviour are available. Consequently, the present experiment was executed to determine the effects of total isolation as well as that of heterosexual contact during the pre- and post-puberal phase on libido, mating dexterity and the occurrence of homosexuality in Karakul rams.

### Procedure

Twenty seven autumn born Karakul ram lambs were

weaned at a mean age of 68 days and randomly allotted to 3 treatment groups. Treatments were as follows:

- Group A: Totally isolated from ewes.
- Group B: Heterosexual contact from weaning until 9 months of age and then isolated.
- Group C: Isolated until 9 months of age and then allowed heterosexual contact.

The rams were kept on natural veld grazing in camps rotated every fortnight. A lick consisting of 40% bonemeal: 40% salt: 20% fishmeal, was supplied *ad libitum*. Ewes introduced to Groups B & C were kept with the group for about 6 weeks whereafter they were slaughtered, inspected for pregnancy and replaced by fresh ewes. The following data were recorded:

1. Observation on behaviour of rams were made from time to time throughout the experimental period which lasted from 16.7.71 to 4.11.72.
2. Birth and weaning mass as well as body mass at monthly intervals after weaning, were recorded.

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3. At 18 months of age all the rams were penned and allowed an adaptation period of 14 days. Prior to commencement of testing, one ram from each group was randomly chosen and these three rams allowed to compete in pairs to serve an oestrous ewe until a rank order of libido for each group was established. The dominant ram in every group of three was allotted a 3 and so forth whereas rams with the same score were allotted the mean of the two scores. These data were pooled for all the rams in a group and a mean order of libido for every group was computed.
4. Subsequent to the libido test the rams were introduced individually to an oestrous ewe in a 3 x 3 m pen. Oestrus was induced by injection of stilboestrol-di-propionate. All rams were tested with regard to the time interval to the first mount as well as the total number of attempts. In addition the time lapse to first intromission and ejaculation as well as the total number of complete matings were recorded. All rams were allowed 5 introductions lasting 10 minutes with at least 8 h intervals. Any ram which showed no interest in the ewe after 5 minutes was removed from the pen.
5. Two days subsequent to the individual tests, semen was collected by electro-stimulation and evaluated as described by Starke (1949).
6. Arithmetic means of the data were calculated and analysed by analysis of variance (Snedecor & Cochran, 1967).

## Results and discussion

### Mass changes after weaning

The growth curves for the three groups are shown in Fig. 1. An interesting feature of these curves is the growth surge experienced by Group C after the introduction of ewes at 9 months of age. The mean mass at weaning was within 2 kg of each other whereas the final mass was highly significantly ( $P < 0,01$ ) in favour of Group C. Apparently post-puberal sexual stimulation resulted in greater release of either testosterone, acting anabolic and/or growth hormone.

### Behaviour prior to testing of rams

Signs of sexual behaviour involving attempts to mount other lambs, or ewes in the case of Group B, were noted at an early age of between two and three months. Fraser (1968) described the occurrence of prepuberal mounting of both hetero- and homosexual nature whereas (Symington (1961) and Louw & Joubert (1964) pointed out that clear signs of libido may be observed in the ram lamb some time before puberty.

In the present study the first successful copulations, as deduced from slaughtered ewes and the development of the embryo, occurred at 144 days of age (Group B). This

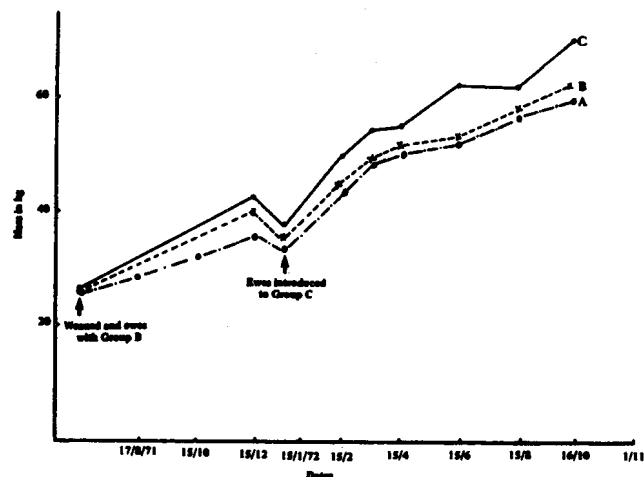


Fig.1 Changes in live mass of Karakul rams

agrees with the finding of Dýrmondsson & Lees (1972) who recorded an age at first mating of 142 days for Clun Forest ram lambs.

### Order of sexual dominance and mating dexterity

Clear cut differences in libido and mating dexterity were established between rams with highly significant ( $P < 0,01$ ) better scores for rams in Groups B & C. Group A rams scored a mean of 2,2 out of a 5 maximum for libido which was highly significantly ( $P < 0,01$ ) less than the 4,7 and 4,8 respectively recorded by rams of groups B and C.

The mean scores for a sequence of 5 introductions to oestrous ewes for time to the first mount, time to the first copulation and total copulations within 10 minutes are given in Table 1. These data indicate a highly significant ( $P < 0,01$ ) quicker reaction of rams in those groups which had had previous contact with ewes (Groups B & C). Moreover, these rams also served more ewes per unit time compared with those in the isolated group. The relatively low percentage (44%) of rams in the isolated groups which were at all interested in oestrous ewes (Table 1), when compared, with the 88 and 100% respectively in Groups B & C, further reflects the inhibiting effects of total isolation on sexual behaviour. The isolated rams, when introduced to a ewe were generally very nervous and easily frightened or distracted by noise or movement, whereas the rams of groups B and C were immediately attracted to the ewe. It was obvious that in the latter cases the sex drive was strong enough to overcome any initial nervousness. The suggestions of Banks (1964) and Pretorius (1967), that the practice of rearing rams is isolation from ewes from the time of weaning could effect sexual behaviour patterns, are confirmed by the present results.

Most observations on sexual behaviour of rams illustrate that sexual behaviour patterns are learnt with mating dexterity improving gradually as the number of sexual encounters increased (Dýrmondsson, 1973). However, in the present study only one of the four active rams in the isolated groups, learned by repetition – the other three being active from the start. In Group B all the active rams (8/8) mated at the first introduction whereas only one of the 9

Table 1

*Time to first attempt, to successful copulation and total number of copulations (Mean, S.E. & range) by rams in periods of 10 minutes (Mean score for 5 replications)*

Group	No ( % ) active	Time in minutes to first mount	Time in minutes to first copulation	Total copulations in 10 minutes
A	4 (44)	6,27 ± 1,45 (010–10,0)	6,92 ± 1,49 (012–10,0)	1,02 ± 0,50 (0 – 5)
B	8 (88)	1,31 ± 1,03 (03–10,0)	1,57 ± 1,06 (06–10,0)	2,56 ± 0,38 (0 – 5)
C	9 (100)	0,89 ± 0,66 (03–10,0) P<0,01	1,17 ± 0,78 (06–10,0) P<0,01	2,69 ± 0,39 (1 – 6) P<0,01

active rams in Group C became interested after sequential introduction to ewes. Apparently rams of groups B & C, having had previous heterosexual contact, were already experienced whereas the isolated rams were probably inhibited to such a degree by lack of contact that even repeated introductions to ewes did not result in normal behaviour. However, sequential introduction to ewes, as illustrated in Figs. 2 & 3, substantially improved mating dexterity in active rams if assessed respectively in terms of the time lapse to copulation, the total number of copulations as well as the recovery period between copulations.

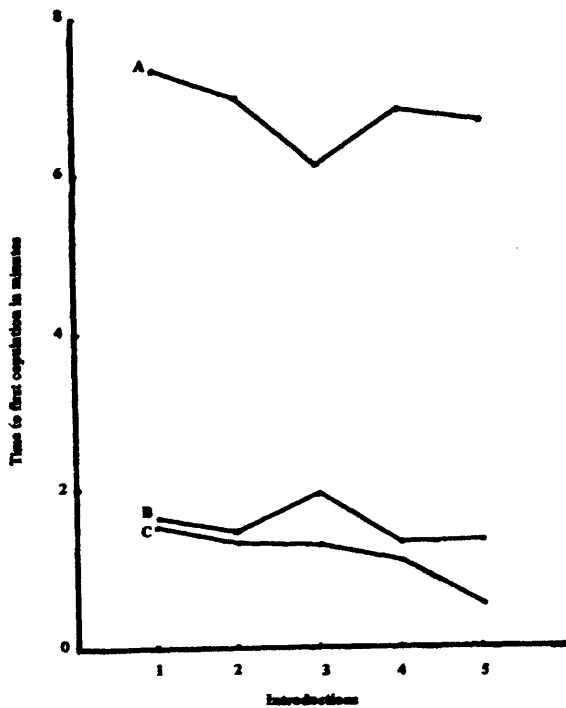


Fig. 2 *The effect of sequential introductions of rams to oestrous ewes on the time lapse to copulation*

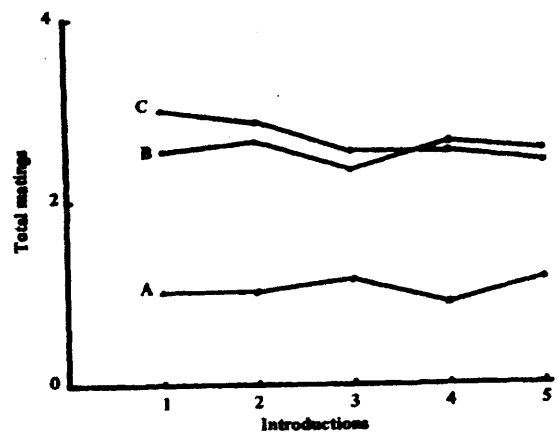
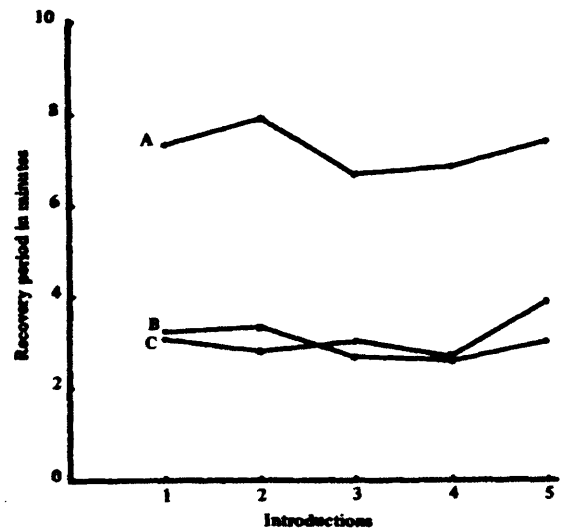


Fig. 3 *The effect of sequential introductions of rams to oestrous ewes on the recovery period between matings and total matings within 10 minutes*

Apart from a tendency to nose the udder region of ewes which was very noticeable in the isolated group, no clear cut homosexual behaviour was observed in any of the rams. The motility, density and proportion of live sperm did not differ between the three groups of rams.

### Conclusions

It is concluded that the rearing of ram lambs in isolation of ewes is an undesirable practice which could adversely affect sexual behavioural patterns. Heterosexual con-

tact prior or subsequent to puberty seems therefore of the utmost importance and should be implemented in sheep husbandry systems. Furthermore the application of a simple libido test at 10 to 12 months of age or prior to their first mating season could probably serve to eliminate shy servers and rams with poor libido. According to Mattner, Braden & George (1973) the failure of the development of normal sexual behaviour could be genetically controlled and if such rams are located at an early stage it could probably substantially improve lambing percentage in sheep. The observation that sexual contact resulted in a growth surge requires further elucidation.

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