S. Afr. J. Anim. Sci. 1, 55–57 (1971)

IS THERE A LACTATION ANOESTRUS IN THE SHEEP?

G.L. Hunter

Department of Agricultural Technical Services, Stellenbosch

OPSOMMING: IS DAAR 'N LAKTASIEANESTRUS BY DIE OOI?

'n Proef is met twintig Suid-Afrikaanse Vleismerino-ooie (teelseisoen begin in Oktober/November) en twintig kruisgeteelde Vleismerino x Border Leicesterooie (teelseisoen begin in Februarie) uitgevoer. Die ooie het gedurende die tweede helfte van Oktober gelam. Die helfte van albei groepe het enkele lammers vir 6 weke gesoog en die ander helfte vir 13–15 weke. Post-partum interval tot eerste estrus is deur gebruik van koggelramme bepaal. In die geval van die kruisgeteelde ooie is estrus op die gewone tyd aan die begin van die teelseisoen getoon en daar was geen verskil in gemiddelde post-partum intervalle as gevolg van verskille in laktasieperiode nie. Die Vleismerino-ooie wat vir 6 weke gesoog was, het gemiddeld 87,7 ± 21,7 dae geneem om eerste estrus te toon, teenoor 93,1 ± 19,6 dae in die geval van die ooie wat 13–15 weke gesoog het. Die verskil tussen hierdie gemiddeldes is nie betekenisvol nie, maar 80% van die kortgesoogdes was binne 100 dae weer bronstig, teenoor 40% van die ooie wat 13–15 weke gesoog het; die oorblywendes van dié groep was almal binne een sikluslengte van speentyd weer bronstig. Die gevolgtrekking is gemaak dat indien ooie voldoende voeding ontvang en soging tot 'n maksimum van ongeveer drie maande beperk word, laktasieanestrus van geen praktiese belang is nie. Die invloed van die lamseisoen in verhouding tot die teelseisoen is waarskynlik van veel groter belang.

SUMMARY

Twenty South African Mutton Merino ewes, whose breeding season begins in October/November, and twenty crossbred Mutton Merino x Border Leicester ewes, whose breeding season begins in February, lambed during the second half of October. Half of each group suckled single lambs for 6 weeks and half for 13–15 weeks. The post-partum interval to first oestrus was determined by using teaser rams. The crossbred ewes showed first oestrus at the usual time at the beginning of the breeding season and there was no difference in mean post-partum interval resulting from differences in length of lactation. The Mutton Merino ewes which suckled lambs for 6 weeks showed first oestrus in 87,7 ± 21,7 days, vs. 93,1 ± 19,6 days in ewes which suckled for 13–15 weeks. The difference between these means was not significant, but 80% of the ewes which suckled for the shorter period showed oestrus within 100 days of lambing, vs. 40% of those suckling for 13-15 weeks. The remaining ewes in the latter group were in oestrus within 1 cycle length of weaning. It is concluded that in ewes which lactate for a maximum of about 3 months and which are adequately fed, lactation anoestrus is of little practical significance. The season of lambing in relation to the breeding season appears to be of far greater importance.

While it is clear that the season of lambing has an important influence on the length of the post-partum anoestrous period (Mauléon & Dauzier, 1965; Hunter, Belonje & van Niekerk, 1970), the evidence regarding the effect of rearing a lamb on the interval between lambing and the recommencement of oestrous activity in the ewe is conflicting (see Hunter, 1968, for review) and continues to merit experimentation. If ewes lamb during the breeding season, there will be little if any effect of seasonal factors on the length of the post-partum anoestrous period, since if the same ewes had not recently been pregnant, they would be expected to show oestrus regularly at this time. Moreover, following lambing during or very shortly before the onset of the breeding season, in the absence of the otherwise overwhelming effect of seasonal anoestrus, the length of the post-partum anoestrous period may be more sensitive to other influences such as lactation in the ewe (Mauléon & Dauzier, 1965).

Under practical conditions and in some field experiments it is often not easy to ensure that lactating ewes consume sufficient food to meet their requirements. A ewe producing as little as 1–1,5 kg milk daily requires an estimated 1,24 kg total digestible nutrients (T.D.N.) per day per 45 kg body weight (N.R.C., 1968). Even if the grazing, which may contain 75–80% moisture, has a T.D.N. content as high as 20%, to meet her energy requirements the ewe would have to eat more than 6 kg of green material daily per 45 kg body weight, which is beyond her capacity. Even the provision of reasonable quantities of supplementary grain to the grazing ewe can scarcely close the gap and so the lactating ewe on such grazing inevitably loses weight. It is therefore difficult under these conditions to determine the effect of lactation *per se* on the length of the post-partum anoestrus, because the effect is confounded with the declining nutritional status of the ewe. Since it is known that inadequate nutritional levels can reduce the incidence of oestrus in non-pregnant ewes, even during the breeding season (Hunter, 1962), it seems important when studying the effect of lactation on post-partum anoestrus, to eliminate as far as possible the effects of dietary deficiencies as well as of seasonal factors.

In the experiment to be reported, half the ewes were South African Mutton Merinos (previously known as German Merinos), whose breeding season in this environment usually commences in about October/November, and half were Mutton Merino x Border Leicester crossbreds, whose breeding season commences in February. Furthermore, the ewes were fed in such a way as to ensure as nearly as possible that their nutrient requirements were met during lactation. The object of the experiment was to determine in such ewes the effect on the length of the post-partum anoestrous period of weaning their lambs

at two different ages, following lambing in October.

Procedure

Twenty Mutton Merino and 20 Mutton Merino x Border Leicester crossbred ewes lambed in good condition during the second half of October and within 24 hr of parturition excess lambs were removed so that all ewes reared single lambs. The ewes were maintained in pens throughout pregnancy and the post-partum period. After lambing the ewes were fed a milled ration consisting of oat hay and lucerne hay in the approximate ratio of 4:3 by weight and, during lactation, about 0,4 kg maize grain per head daily. The hay was fed *ad lib.* and daily consumption was estimated to average between 2 and 2,5 kg per head. Mean daily T.D.N. intake was therefore about 1,32–1,57 kg per ewe. The lambs reared by the ewes had access to maize meal in a creep and, after being randomly selected, half were weaned at 40 days of age while the remainder were weaned on January 19, when they were 13–15 weeks old. Raddled teaser rams were introduced to the pens in the middle of November and the date of first post-partum oestrus was recorded for each ewe.

Results

The data recorded for individual ewes are given in Table 1. Post-partum live weight changes were negligible, amounting to a mean loss of 0,26 kg per ewe in 40 days. The mean post-partum intervals to oestrus for ewes which suckled lambs for 40 days and for ewes which suckled lambs until January 19 were respectively 87,7 ± 21,7 and 93,1 ± 19,6 days in the case of the Mutton Merinos, and 117,5 ± 13,6 and 117,9 ± 11,7 days in the case of the Border Leicester crossbreds. Differences between the means for breeds were statistically significant ($P<0,01$), but for lengths of lactation were not. It is clear that the crossbred ewes recommenced oestrus as usual at the start of their breeding season in February. Presumably their post-partum anoestrus was prolonged by seasonal factors and was probably not influenced by lactation because this was completed in both groups before their breeding season was expected to begin. For the Mutton Merinos, on the other hand, a consideration only of the means is not adequate, for even with only ten ewes per group, there seem to be two important differences in the rates of return to oestrus *post partum.* The first is that eight of the early weaned group showed oestrus within 100 days of lambing, while in the group weaned at 13–15 weeks only half that number had shown oestrus by that stage. These four ewes were still lactating when they were marked by the ram. The second difference is that whereas the early weaned group made no obvious oestrous response to weaning, 60% of the ewes in the second group (i.e. all those not yet marked by the rams) showed first oestrus within one oestrous cycle length of weaning.

Among the crossbred ewes there was a significant regression of post-partum interval (Y) on lambing date in October (X), viz. $Y = 145,9 - 1,14X$ ($P < 0,05$). This regression was not, however, significant among the Mutton Merinos, and in neither purebreds nor crossbreds was there any significant relationship between post-partum interval and either body weight after lambing or change in weight during the first 40 days *post partum.*

Table 1

Post-partum intervals to first oestrus in ewes

Suckled lambs for 40 days				Suckled lambs for 13–15 weeks			
Lambing date 1970		First oestrus 1970/71	Interval (days)	Lambing date 1970		First oestrus 1970/71	Interval (days)*
Mutton Merino ewes							
Oct. 20		Dec. 27	68	Oct. 17		Jan. 17	92*
23		Dec. 20	58	19		Feb. 4	108
23		Jan. 6	75	22		Dec. 29	68*
24		Jan. 27	95	23		Feb. 10	110
26		Jan. 13	79	24		Feb. 4	103
27		Jan. 6	71	25		Dec. 18	54*
28		Mar. 9	132	26		Feb. 12	109
30		Feb. 7	100	30		Feb. 8	101
30		Feb. 4	97	30		Jan. 17	79*
31		Feb. 10	102	31		Feb. 15	107
Mutton Merino x Border Leicester crossbred ewes							
Oct. 16		Feb. 27	134	Oct. 17		Feb. 11	117
17		Feb. 9	115	17		Feb. 23	129
21		Feb. 8	110	18		Feb. 23	128
24		Mar. 1	128	25		Mar. 3	129
25		Mar. 12	138	26		Feb. 23	120
27		Feb. 11	107	27		Feb. 20	116
29		Feb. 26	120	27		Feb. 18	114
29		Mar. 1	123	29		Jan. 26	89*
30		Feb. 11	104	29		Feb. 28	122
31		Feb. 4	96	30		Feb. 22	115

*Oestrus while lactating

Discussion

In the Mutton Merino ewes, lambing occurred at the beginning of the normal breeding season, when the seasonal effect on the post-partum interval to oestrus should have been minimal. Although the difference between the early and late weaned groups in respect of the mean post-partum intervals was not significant, it was notable that the majority of those which suckled for the longer period, showed first post-partum oestrus only after their lambs had been weaned. In the crossbred ewes, on the other hand, lambing occurred three months before the expected start of their breeding season and the mean post-partum interval to oestrus was about 30 days less than that recorded in a previous experiment with similar ewes which lambed at about the same time of the year (Hunter *et al.*,

1970). When such ewes lamb at this time of year, it seems that the seasonal anoestrus and the post-partum anoestrus may be said to have coincided and that the superimposed effect of lactation, which was completed before the expected onset of the breeding season, made no difference to the time taken to resume oestrus after lambing. It therefore seems likely that in both breed groups an even longer period of lactation might have had a more convincing effect on the post-partum interval to first oestrus. Hunter & Lishman (1967) and Hunter & van Aarde (report in preparation) also recorded the mean post-partum intervals to oestrus in Mutton Merino ewes which lambed at about this time of year. In the first case the lambs were removed from the ewes at 1 or 20 days of age and in the second at 1 or 40 days and in both experiments, as in the present one, the ewes,which lactated for more than a day suckled only one lamb. In neither of these experiments did the length of the suckling period influence the mean interval between lambing and first oestrus. Taken together, the results of the three experiments suggest that a significant delay in first oestrus due to lactation is unlikely in ewes of this breed which are adequately fed, provided the lactation is restricted to a maximum of about 3 months.

Land (1971) has reported the incidence of oestrus between 3 and 56 days after spring lambing in Finnish Landrace x Dorset Horn crossbred ewes, as well as in both parental breeds. In one group of crossbred ewes, 50% of 62 ewes which weaned one lamb showed oestrus in a mean of 27,6 ± 2,62 days, while four out of seven ewes which weaned no lambs showed oestrus in a mean of 37,2 ± 5,75 days after lambing. On the other hand, Restall (1971) has reported delays in first post-partum ovulation within 40 days of lambing in ewes which suckled lambs compared with those which did not. The lambs of his Dorset Horn x Merino crossbred ewes were removed either at birth or at 40 days and all the non-lactating ewes apparently showed oestrus twice within 40 days of lambing, while 40% of the lactating ewes showed it once in that period. Furthermore, Mallampati, Pope & Casida (1971) found a significant effect of suckling in Targee ewes lambing throughout the year. In their experiment, the mean post-partum intervals to oestrus, in ewes which suckled lambs for 42 days, ranged from 8 to 33 days longer than in ewes which suckled for only 1 day. There was, however, no significant month x suckling interaction in these data. Neither Land, Restall nor Mallampati *et al.* give any information on the nutritional levels available to the ewes in their experiments.

It appears, therefore, that suckling a lamb for long enough may possibly delay the ewe's return to oestrus after lambing, but in most of the reports that have been published the evidence for a "true" lactation anoestrus is not conclusive, because it is not clear whether the feeding of the lactating ewes was adequate to meet their needs. Where differences in post-partum interval to first oestrus do result from lactation in properly fed ewes, these seem to be rather small and of no great importance in practice. The season of lambing, especially in relation to the breeding season of each breed or cross, seems to be relatively of far greater significance.

References

HUNTER, G.L., 1962. Proc. S. Afr. Soc. Anim. Prod. 1, 67.

HUNTER, G.L. & LISHMAN, A.W., 1967. J. Reprod. Fert. 14, 473.

HUNTER, G.L., 1968. Anim. Breed. Abstr. 36, 347.

HUNTER, G.L., BELONJE, P.C. & VAN NIEKERK, C.H., 1970. Proc. S. Afr. Soc. Anim. Prod. 9, 179.

LAND, R.B., 1971. J. Reprod. Fert. 24, 345.

MALLAMPATI, R.S., POPE, A.L. & CASIDA, L.E., 1971. J. Anim. Sci. 32, 673.

MAULÉON, P. & DAUZIER, L., 1965. Annls Biol. anim. Biochim. Biophys. 5, 131.

N.R.C., 1968. Nutrient Requirements of Sheep. Publ. 1963, Nat. Acad. Sci., Nat. Res. Counc., Washington, D.C.

RESTALL, B.J., 1971. Proc. Aust. Soc. Reprod. Biol., J. Reprod. Fert. 24, 145.