THE EVALUATION OF FIVE MATING SEASONS PER YEAR FOR DORPERS AT KALAHARI RESEARCH STATION

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ABSTRACT

The system of five mating seasons per year for Dorper sheep was evaluated. Ewes were mated every 10 months. The objective is to present the system to the farmers as a system with a more even distribution of carcass production throughout the year, compared to the traditional system where ewes are mated during March and/or September. A positive correlation (r=0.72) between percentage of twin births and impregnation percentage was found for the mating seasons from September 1990 to June 1993 (A90 to E93). A negative correlation (r=-0.56) between impregnation percentage and average corrected 100-day mass for ewe lambs was found for these mating seasons, indicating a compensating effect. When the impregnation percentage of the ewes and the percentage of twin births are relatively low (B mating season means 72 and 8% respectively), the average corrected 100-day mass of the individual ewe lambs is relatively high (29.8 kg), and vice versa (D mating season means 88 and 40%; 23.2 kg) for the A90 to E93 mating seasons. A positive correlation (r=0.56) between impregnation percentage and average weaned/slaughter lamb-mass per ewe mated was found, as calculation of the latter includes impregnation rate. For these seasons, no difference was found between the average corrected 100-day mass for ewe lambs and average weaned/slaughter lamb-mass per ewe mated (P=0.85). No difference was found between individual the mating seasons (September 1990 to June 1993) for both the average corrected 100-day mass for ewe lambs and the average weaned/slaughter lamb-mass per ewe mated (P=0.47 and P=0.44 respectively). It can not be confirmed statistically whether this system is better or not than the traditional system. However, as the mating season means for the average weaned/slaughter lamb-mass per ewe mated for the A (September) and D (March) mating seasons, which correspond with the traditional system used by Dorper farmers, were higher than the period mean for this factor, the higher management inputs of the system of five mating seasons per year should be questioned.

INTRODUCTION

Generally, most extensive sheep farmers in Namibia use a mating season(s) for Dorper ewes during March and/or September, or a system where the rams are repeatedly used for a month and then rested for a month throughout the year (month-in month-out). This practice results in an uneven production of lamb carcasses throughout the year, with an over production during July and a shortage during December. It must, however, be noted that this system also entails a live slaughter mass of between 32 and 36 kilogram, resulting in a varying slaughter age depending on environmental factors, and which thus influences the carcass grade and price compared to the system evaluated.

Louw (1982) recommends a slaughter mass of 32 to 35 kilograms as ideal for mutton sheep. According to Terblanche (1977), a live mass of 36 kilogram can already be reached at three and a half to four months of age in Dorper lambs from the veld, with a carcass mass of 16 kilogram.

The reproduction rate can be increased through the selection for multiple births (Elias, Cohen & Dayenoff, 1985). Barton (1984) has found that there is a decrease in the amount of fat in carcasses of twin lambs and an increase in meat production per ewe that is rearing twin lambs.

Joubert (1972) (sub-tropical Northern Transvaal) determined that Dorper ewes lambing during spring, perform much better with a lambing percentage of 113.4% than ewes lambing during summer, winter and autumn (average lambing percentages range from 78.4 to 85.0%). Highly significant differences was found in post-partum anoestrus with a clear tendency for longer a longer resting period for ewes lambing during the spring and winter (123.2 and 122.8 days respectively) and the shortest period for ewes lambing during autumn. Autumn mating thus leads to higher fertility, while spring mating with a lower average lambing percentage has the shortest re-impregnation period, thus resulting in a compensating effect.

With this project, the system of five mating seasons per year is evaluated, where every ewe is mated every 10 months. The objective of the project is to present the system to the farmers as a system with a more even distribution of carcass production throughout the year.

MATERIALS AND METHODS

The project commenced in January 1989, with the last mating season in September 1993. During the first two and a half years (mating seasons January 1989 to June 1991), the ewe flock was expanded from the original 270 ewes to about 520 ewes and the age structure of the flock was corrected to an average of 20% young ewes for each mating season.

The total flock was divided into four groups (25% of the total flock) and assigned to a specific mating group for the first year (1989). After the first year, ewes were mated every 10 months, with a second chance during the following mating season if not impregnated the first time. The ewes thus moved back one mating season every year, for instance from A90 (September 1990) to E91 (May 1991) to D92 (March 1992) mating seasons, except where one mating season was

skipped. Ewes that were not impregnated during two consecutive mating seasons were culled. Young ewes were mated for the first time at 10 months of age.

The mating seasons were as follows:

A: 15 September – 5 October
B: 15 November – 5 December
C: 15 January – 5 February
D: 15 March – 5 April
E: 15 May – 5 June
For example, the mating season A90 thus refers to lambs born from ewes mated during September 1990 and born February 1991.

Ewes were weighed at the start of every mating season. Lambs were weighed every 4 weeks, with the last weighing at weaning/slaughtering. Up to the E91 mating season (May 1991), lambs were marketed in up to three groups as they reached about 120 days of age, to give the smaller lambs a better chance for higher carcass mass and grading. As from the A91 season (September 1991) onwards, only one weaning/ slaughter date was used at a group average age of 120 days. A different slaughter carcass is produced at approximately four months of age in this system, compared to the traditional system where lambs are slaughtered at 32 to 36 kilogram live mass at different ages.

Jandel Scientific, SigmaStat 2.0 (1992-1995) was used to analyze the data. Analyses included correlations for impregnation percentage and percentage of twin births, impregnation percentage and average corrected 100-day mass for ewe lambs, impregnation percentage and average (live) slaughter lamb-mass per ewe mated, and average corrected 100-day mass for ewe lambs and average slaughter lamb-mass per ewe mated for the mating seasons A90 to E93 (September 1990 to June 1993). An ANOVA was conducted

to determine differences between mating season means for the mating seasons A90 to E93. A t-test was run to determine the difference between the average corrected 100-day mass for ewe lambs and the average slaughter lamb-mass per ewe mated for the A90 to E93 mating seasons.

RESULTS AND DISCUSSION

The reproduction means for the mating seasons A90 to E93 (September 1990 to June 1993) are shown in Table 1.

The following formulas were used for the calculation of the reproduction data:

(Number of ewes mated refers to the number of ewes available for mating.)
Lambing percentage = (number of lambs born / number of ewes mated) x 100
Impregnation percentage = (number of ewes impregnated / number of ewes mated) x 100
Percentage twin births = (number of ewes with twins / number of ewes which lambed) x 100
Weaning percentage = (number of lambs weaned / number of ewes mated) x 100
Corrected 100-day mass and ADA (average daily gain per day of age) were calculated with the Stutmaster Program for Sheep (constants were used for sex of lambs and single or twin status of lambs and age of mothers).
Average weaned lamb-mass per ewe mated = total weaned lamb-mass / number of ewes mated.

A positive correlation (r=0.72) was found between the impregnation percentage and percentage of twin births for the individual mating seasons A90 to E93 (September 1990 to June 1993) (Figure 1).

Table 1. Reproduction means for the mating seasons over the three-year period from September 1990 to June 1993 (A90 to E93)

	A MATING SEASONS	B MATING SEASONS	C MATING SEASONS	D MATING SEASONS	E MATING SEASONS	PERIOD AVERAGE
Mating group	A90 – A 92	B90 – B92	C91 – C93	D91 – D93	E91 – E93	A90 – E93
Mating Period	15/09 – 05/10	15/11 – 05/12	15/01 – 05/02	15/03 – 05/04	15/05 – 05/06	
Lambing season	06/02 – 05/03	08/04 – 10/05	06/06 – 06/07	03/08 – 05/09	01/10 – 07/11	
N ewes mated	408	446	516	440	429	2 239
N ewes impregnated	333	320	433	389	363	1 838
Impregnation %	82	72	84	88	85	82
N lambs born	385	345	519	552	472	2 273
Lambing %	94	77	101	125	110	102
N lambs weaned	343	312	463	470	414	2 002
Weaning %	84	70	90	107	97	89
Av. Weaning mass (kg) (Ewes & Wethers)	31.46 & 34.90	30.73 & 32.00	26.62 & 29.28	23.21 & 24.82	26.74 & 28.48	27.76 & 29.89
Av. Weaning age (days)	110	108	124	118	124	117
Av. Cor. 100-day mass (kg) (Ewes & Wethers)	31.90 & 34.37	29.80 & 31.13	25.37 & 26.77	23.53 & 23.97	25.27 & 26.33	27.17 & 28.51
ADA (E & W) (g/day)	262 & 284	250 & 256	195 & 205	165 & 168	189 & 195	212 & 222
Av. weaned lamb-mass / ewe mated (kg)	27.14	21.43	23.62	25.80	25.16	24.46

ADA = Average daily weight gain in gram/day of age; E = Ewes; W = Wethers (Hamels); N = Number of (observations); Av. = Average; Cor. = Corrected.

The mean impregnation percentage and lambing percentage for the total mating period (A90 to E93) was 82 and 102% respectively, with the mating season means ranging from 72 to 88% and 77 to 125% respectively (Table 1). For the individual mating seasons for this period, the impregnation percentage and percentages twin births ranged from 65 to 93% and 3 to 50% respectively (Figure 1). On average, the D mating seasons had the highest (88 and 40%) and the B mating seasons the lowest (72 and 8%) mean impregnation percentage and percentage of twin births respectively for this period.

The mean weaning percentage for the period A90 to E93 (September 1990 to June 1993) was 89%, ranging from 70 to 107% for the mating season means (Table 1). The lowest mating season mean weaning percentage was recorded for the B mating season (70%), with the above mating season means recorded for the C, D and E mating seasons for the three-year period. The average weaning mass for ewes and wethers for the period A90 to E93 was 27.76 and 29.89 kilogram respectively (Table 1), with mating season means below the period average for lambs born from the C, D and E

mating seasons.
The average corrected 100-day mass and average daily gain per day of age (ADA) for ewes and wethers for the A90 to E93 mating seasons was 27.17 and 28.51 kilogram and 212 and 222 g/day respectively (Table 1). The mating season means for both these factors below the period mean were recorded for lambs born from the C, D and E mating seasons (Table 1). The average weaned/slaughter lamb-mass per ewe mated was 24.46 kilogram for the period A90 to E93, with the mating season means ranging from 21.43 to 27.14 kilogram (Table 1). Mating season means below the year average for this factor were recorded for lambs born from the B and C mating seasons (Figure 2).

When the graph for the impregnation percentage for the mating seasons A90 to E93 (Figure 1) is compared with the graph for the average corrected 100-day mass for ewe lambs for these mating seasons (Figure 2), it indicates a compensating effect. There is a negative correlation (r=-0.56) between the impregnation percentage of the ewes and the average corrected 100-day mass of the individual ewe lambs for these mating seasons. When the impregnation percentage of the
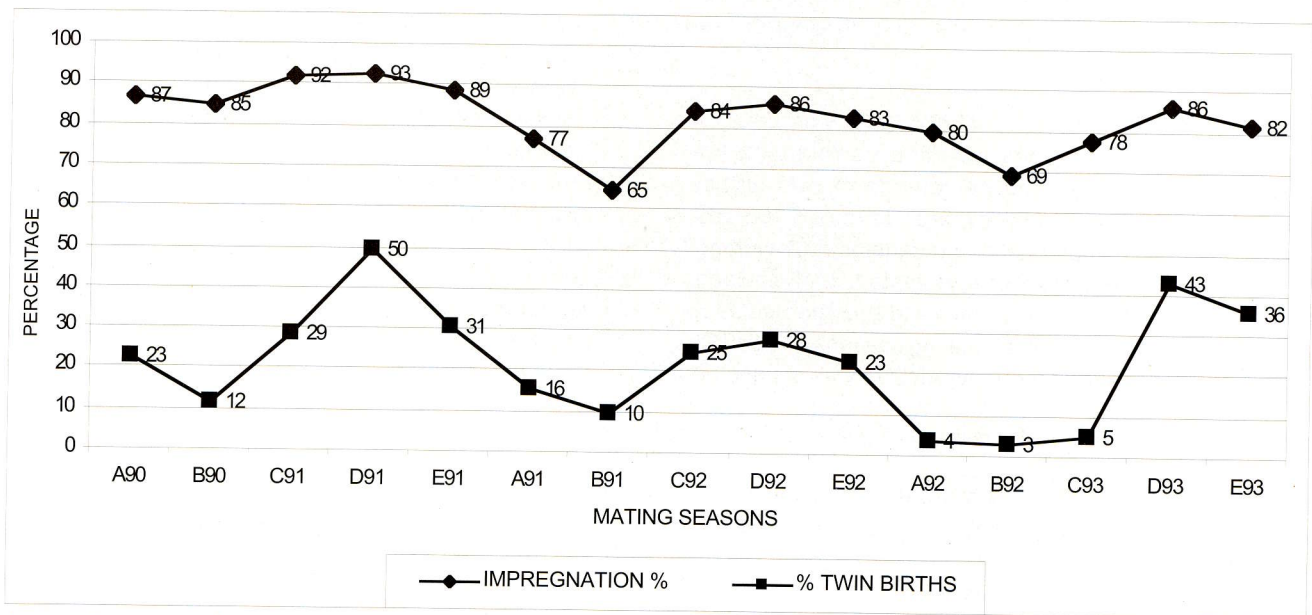

Figure 1. Percentage of twin births and impregnation percentage for the mating seasons A90 to E93.

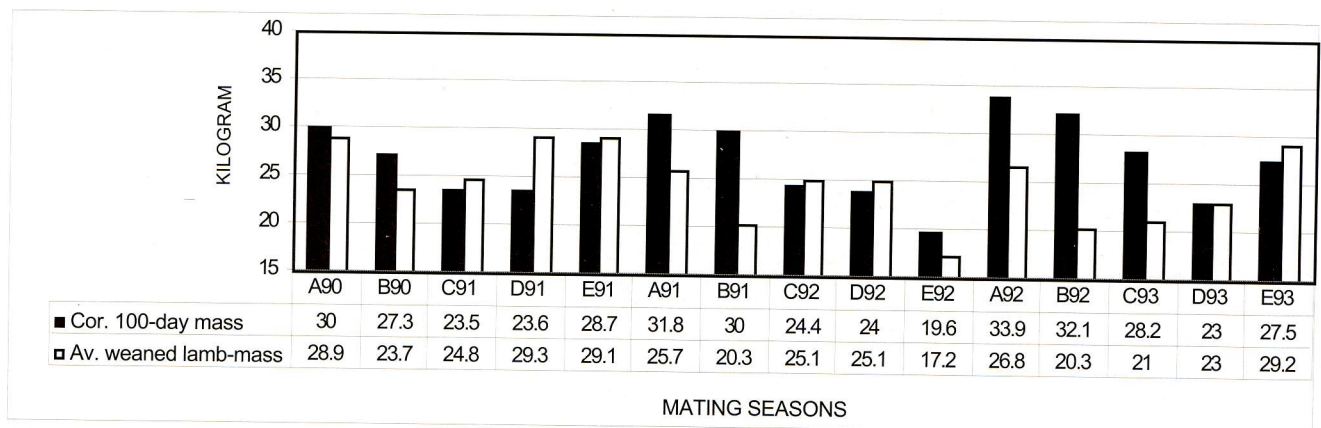|	A90	B90	C91	D91	E91	A91	B91	C92	D92	E92	A92	B92	C93	D93	E93
■ Cor. 100-day mass	30	27.3	23.5	23.6	28.7	31.8	30	24.4	24	19.6	33.9	32.1	28.2	23	27.5
□ Av. weaned lamb-mass	28.9	23.7	24.8	29.3	29.1	25.7	20.3	25.1	25.1	17.2	26.8	20.3	21	23	29.2

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Figure 2. Average corrected 100-day mass for ewe lambs and average weaned/slaughter lamb-mass per ewe mated for mating seasons A90 to E93.

ewes and thus the percentage of twin births are relatively low, the average corrected 100-day mass of the individual lambs is relatively high, and vice versa. However, when the impregnation percentage (Figure 1) is compared to the average weaned/slaughter lamb-mass per ewe mated (Figure 2), a positive correlation (r=0.56) was found, as calculation of the latter includes impregnation rate.

No significant difference (P=0.085) was found between the average corrected 100-day mass for ewe lambs and the average weaned/slaughter lamb-mass per ewe mated, for the mating seasons A90 to E93 (September 1990 to June 1993) (Figure 2). No difference was also found between the individual mating seasons A90 through E93 for both the average corrected 100-day mass for ewe lambs and the average slaughter lamb-mass per ewe mated (P= 0.47 and P=0.44 respectively).

Since the carcass grading system changed several times during the project, it is not possible to analyse carcass data statistically. It can also not be confirmed statistically whether this system is better or not than the traditional system. However, farmers can use these results as an indication of the merit of this system. As the mating season means for the average weaned/slaughter lamb-mass per ewe mated for the A (September) and D (March) mating seasons, which correspond with the traditional system used by Dorper farmers,

were higher than the period mean for this factor, the higher management inputs for the system of five mating seasons per year should be questioned.

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