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The influence of reproduction and lambing season of the Döhne Merino on different wool production traits

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Reproductive ability had a significant effect ($P \leq 0,05$) on greasy fleece mass and staple length, whilst the percentage clean yield and clean fleece mass was influenced highly significantly ($P \leq 0,01$). Bodymass had a highly significant influence ($P \leq 0,01$) on reproductive ability. Lambing season had a highly significant influence ($P \leq 0,01$) on the percentage clean yield, staple length, fibre diameter, fibre density and bodymass, whereas crimp frequency was significantly different ($P \leq 0,05$) between lambing seasons.

Reproduktiewe vermoë het 'n betekenisvolle ($P \leq 0,05$) invloed op rouvagmassa en stapellengte gehad, terwyl persentasie skoonwolproduksie en skoonvagmassa hoogs betekenisvol ($P \leq 0,01$) beïnvloed is. Liggaamsmassa het 'n hoogs betekenisvolle invloed ($P \leq 0,01$) op reproduktiewe vermoë getoon. Lamseisoen het 'n hoogs betekenisvolle invloed ($P \leq 0,01$) op die persentasie skoonwolproduksie, stapellengte, veseldeursnit, veseldigtheid en liggaamsmassa gehad, terwyl kartelfrekwensie betekenisvol ($P \leq 0,05$) tussen lamseisoene verskil het.

Keywords: Döhne Merino, wool production, reproductive ability, lambing season

The aim of this study was to determine the influence of reproductive ability and lambing season on different production traits. Wool and skin samples were taken from all Döhne Merino stud ewes present at the Döhne Research Station in June 1979. Most of the ewes lambed during autumn, whilst a smaller number was due to lamb in the following spring.

Table 1 The influence of reproductive ability on different wool production traits by Döhne merino ewes

			Wool production traits								
Reproductive ability	Number of animals	Average age (years)	Greasy[a] fleece mass (kg)	Clean[b] wool yield (%)	Clean[b] fleece mass (kg)	Staple[a] length (mm)	Fibre diameter (µm)	Crimp frequency (/25 mm)	S:P ratio	Fibre density (/cm²)	Body-[b] mass (kg)
Singles	186	4,40	3,21	67,80	2,18	83,52	22,86	13,66	13,50	4059	50,19
Twins	26	5,52	3,09	67,50	2,09	80,35	22,88	13,64	12,99	3978	56,42
No lamb	50	4,40	3,25	71,40	2,33	86,08	23,18	13,98	13,69	4114	51,75
Dead lamb	22	4,50	3,05	70,60	2,15	81,86	22,57	13,92	14,16	4089	49,66
Never lambed	16	2,00	3,48	69,20	2,41	92,19	21,90	13,66	12,95	4758	51,23
Total/Av.	300		3,22	69,30	2,23	84,80	22,68	13,77	13,46	4199	51,85

[a]$P \leq 0,05$; [b]$P \leq 0,01$

Table 2 The influence of lambing season on different production traits of Döhne merino ewes

				Wool production traits								
Lambing season	Number of animals	Average age (years) (%)	Lambing % (1979)	Greasy[a] fleece mass (kg)	Clean[b] wool yield (%)	Clean[b] fleece mass (kg)	Staple[a] length (mm)	Fibre diameter (µm)	Crimp frequency (/25 mm)	S:P ratio	Fibre density (/cm²)	Body-[b] mass (kg)
Spring	43	6,81	98	3,12	70,90	2,22	75,21	23,93	13,09	13,06	3634	58,10
Autumn	258	3,95	46	3,23	68,30	2,20	85,38	22,68	13,88	13,59	4183	49,77
Total/Av.	301			3,21	68,70	2,21	83,93	22,86	13,77	13,52	4104	50,96

[a]$P \leq 0,05$; [b]$P \leq 0,01$

In allocating the ewes into their respective reproductive groups, the lambing crop of the previous lambing season was taken into account.

Sampling and determination of fibre density were described by Steinhagen (1981). Skin samples were analysed by normal histological techniques (Carter & Clarke, 1957; Grobler, unpublished data, 1980; Nay, 1975). To investigate the influence of reproductive ability and lambing season on skin and fibre traits as well as bodymass, one-way classification variance analysis was undertaken.

From Table 1 it is clear, that ewes which had never lambed before, produced the highest greasy and clean fleece mass (3,48 kg and 2,41 kg respectively), whereas ewes which produced a dead lamb, produced the lowest greasy fleece mass (3,05 kg; Table 1). Ewes with twins produced the lowest clean fleece mass (2,09 kg). The high production of ewes which had never lambed before, could be explained by the lack of stress caused by pregnancy and lactation which other ewes experienced. In contrast the lowest clean fleece mass of ewes delivering and rearing twin lambs could be explained by the consequences of reproduction. This group also proved to have the lowest percentage clean yield. These findings agree with Brown, Turner, Young & Dolling (1966), who found that the percentage clean yield is 2,07% higher with Merino ewes which have not lambed, whereas ewes with a lamb showed a lower clean yield by 1,41% than the average of the flock.

With staple length it was once again found that ewes which have never lambed before produced the longest staple (92,19 mm), whereas ewes with twins produced the shortest staple length (80,35 mm). Results of Brown, *et al.* (1966) were similar, although differences between groups in this study were higher.

It was found, that ewes with twins had the highest bodymass (56,42 kg), whereas ewes which had a dead lamb had the lowest bodymass (49,66 kg). It can therefore be expected that heavier ewes would have a higher reproductive ability as compared to their lighter counterparts.

The highly significantly lower percentage clean yield experienced with ewes lambing in autumn (46%) as compared to ewes lambing in spring (98%) could be ascribed to the younger average age (3,95 years as compared to the spring ewes (6,81 years; Table 2). This conclusion is based on results of Brown, *et al.* (1966).

Ewes which lambed in autumn produced a longer staple (85,38 mm) as compared to ewes which lambed in spring (75,21 mm). The higher lambing percentage (98%) of the spring group contributed to the average lower staple length of this group as compared to the autumn-lambing group. The lower bodymass of ewes lambing in autumn (49,77 kg), resulted in a higher fibre density (4183/cm²) ($r = -0,19$; $P \leq 0,01$, Steinhagen, 1981), as compared to ewes lambing in spring (58,10 kg and 3634/cm²; Table 2). Owing to the higher fibre density of the autumn-lambing ewes, the fibre diameter was lower (22,68 µm) and the crimp frequency slightly higher (13,88/25 mm) as compared to their spring-lambing counterparts (23,93 µm and 13,09/25 mm respectively).

In conclusion, this study proved that bodymass influenced reproductive ability, which contributed significantly to differences in wool production traits. Differences in production traits between lambing seasons could be attributed mainly to the differences in age between the two groups.

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