The utilization and supplementation to stubble lands for South African Mutton Merino ewes

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Abstract

Title:	The utilization and supplementation to stubble lands for South African Mutton Merino ewes.
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An experiment was conducted to determine the effect of the frequency of supplementary feeding on the production of South African Mutton Merino (SAMM) ewes grazing wheat stubble. One hundred and sixty ewes were randomly divided into two groups that consisted of four groups each. Eight camps were grazed for 138 days during which lambing occurred. Four groups of 25 ewes each grazed a 17 ha camp at a stocking density of 5.8 ewes/ha and four groups of 15 ewes each grazed a 12 ha camp at a stocking density of 5.0 ewes/ha. A combination energy/protein supplement was made available to the ewes as a lick. Two of the groups received no supplementary feed (control), two groups received 200 g/ewe/day, two groups received 400 g/ewe every second day and two groups received 600 g/ewe every third day. The smallest decrease in weight during the feeding period was observed in the ewe group that received supplementation every day as well as the ewe group that received supplementation every second day, but no significant differences were observed between these two groups. The smallest decrease in weight over the total feeding period was observed in the three ewe groups that received supplementation ($P < 0.1$), while the ewes that received none (control groups) lost the most weight during the same period. All supplemented groups performed significantly better than the unsupplemented control group in terms of the liveweight change over the feeding as well as the total period. No significant differences occurred in the lambing percentage, weaning percentage, birthweight, 42-day weight and survival rate of the lambs due to the different feeding regimes. It was concluded that supplementation to ewes every third day or every second day is an economically feasible option and will reduce labour and transport costs.

In the second study the effect of stocking density on canola stubble composition and subsequently the production of SAMM ewes on this type of stubble was investigated. Forty-eight ewes were randomly divided into four groups that grazed canola stubble at a stocking density of approximately 1.5, 3.5, 5.5 and 7.5 ewes/ha for 152 days. The ewes did not receive any supplementation and were weighed every 14 days. Parturition occurred during the last week in March 1997 until the first week in May 1997, and the lambs were weighed at birth, and every 14 days thereafter. Stubble samples were collected from the paddocks during the first part of the trial (January and February) and at the end of the trial (April and May) by cutting ten replicate quadrates per paddock and were analysed for dry matter (DM), crude protein (CP), acid detergent fibre (ADF), neutral detergent fibre (NDF) and *in vitro* digestibility of organic matter (IVDOM). The live weight of the ewes at a stocking density of 5.5 ewes/ha decreased significantly, while the ewes at a stocking density of 1.5 ewes/ha gained weight. The ewes at a stocking density of 3.5 ewes/ha had the lowest weight loss ($P = 0.01$). Stocking density did not affect the birthweight of the lambs significantly. The CP concentration of the stubble decreased with an increase in stocking density, while the ADF and NDF concentration of samples were significantly higher at the higher stocking density.

In the third study the supplementation of rumen inert fat or starch on the production of ewes grazing wheat stubble, was investigated. Fifty-six SAMM ewes were randomly divided into four groups of 14 ewes each, grazing the wheat stubble at a stocking density of 4.6 ewes/ha. Each group was supplemented with 250 g/ewe daily for the last six weeks of pregnancy, which was increased to 360 g/ewe during the first four weeks of lactation. Supplementation was supplied on Mondays, Wednesdays and Fridays for a 70-day period. The CP concentration of the supplement varied between 16.7 % and 19.6 %, while the total digestible nutrient (TDN) content varied between 52.0 % and 76.7 %. No significant difference ($P > 0.05$) occurred between the live weights of ewes during the last six weeks of pregnancy, the first four weeks of lactation, or the total feeding period. The ewes in the 50 % fat plus 50 % maizemeal group lost less weight ($P \leq 0.08$) during lactation than the ewes that received maizemeal as their main energy source. The study indicated that there was no significant advantage in the live weight change of the ewes during the experimental period, when compared to the group that received wheat bran (control group).

In the fourth study the economic advantage of supplementation to SAMM ewes grazing wheat- or oat stubble were studied. Three hundred and sixteen ewes were divided into four flocks, of which two grazed oat stubble and two wheat stubble. Each of these four flocks was again

subdivided into four subdivisions of which two subdivisions received supplementation and two none. Four subdivisions received 200 g/d for 83 days, and the other four subdivisions received 200 g/d for 44 days after which it was increased to 300 g/d for 37 days (81 days in total). The ewes were weighed monthly. The final bodyweight of the ewes that received supplementation was significantly higher than those that received none. Over the feeding period, the ewes that received supplementation had a significant lower weight loss in comparison to the ewes that did not receive supplementation. The 42-day weight of the lambs improved significantly due to supplementation, but no significant increase was indicated in the birthweight, weaning weight and survival rate of the lambs whose mothers received supplementation.

In the fifth study the influence of supplementary feeding to ewes and creep feeding of their lambs on the production of both the ewes and lambs were studied. One hundred and sixty eight ewes were divided into two groups of 68 and 100 ewes that grazed a 12.9 and 18 ha camp respectively. Each of these ewe groups was subdivided into four groups of which two ewe groups received supplementation and two none. Within each ewe group two groups of lambs received creep feeding and two received none. A two (supplementation of ewes) by two (creep feeding of lambs) factorial design was used. Supplementation was supplied at 200 g/d for the first 69 days and 300 g/d for the next 120 days to ewes. Lambs received an average of 0.58 kg creep feed per day for 96 days. It was concluded that the live weight change (LWC) of the ewes during the experimental period was not affected significantly by creep feeding of their lambs. Ewes that received supplementation maintained higher live weights than their counterparts for most of the feeding period, although final weights at the end of the experimental period did not differ significantly. The average daily gain (ADG) of the lambs whose mothers received supplementation tended to be higher than that of mothers that received no supplementation, while the ADG of the lambs that received creep feeding was significantly higher than the lambs that received none.

In the sixth study the carry-over effect of supplementation in the previous year on the production of the ewes in the following year was studied. Three hundred and sixteen ewes were divided into four flocks, of which two grazed oat stubble and two wheat stubble. Each of these four flocks was again subdivided into four subdivisions of which two subdivisions received supplementation and two none. Four subdivisions received 200 g/d for 83 days, and the other four subdivisions received 200 g/d for 44 days after which it was increased to 300 g/d for 37 days (81 days in total). The ewes were weighed monthly. Results indicated that birth status (lambs born per ewes mated) of lambs showed a tendency to increase in 1999 due to supplementation in 1998, while

weaning status was not significantly affected. Due to multiple births in the supplemented groups, the birthweight and weaning weight of lambs was negatively affected by supplementation. The study concluded that supplementary feeding in the previous year did not have significant carry-over effects in the following year. However, the effect may have been influenced by the fact that mature animals were used in the study, while the pasture availability during the non-productive stage will also affect possible carry-over effects.

Samevatting

Titel:	Die benutting en byvoeding van stoppellande aan Suid-Afrikaanse Vleismerino ooie.
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'n Eksperiment is uitgevoer om te bepaal wat die invloed van die frekwensie van byvoeding op die produksie van Suid-Afrikaanse Vleismerino (SAVM) ooie wat koringstoppel bewei, sal wees. Eenhonderd-en-sestig ooie is ewekansig in twee groepe verdeel wat bestaan het uit vier groepe elk. Die agt kampe is vir 138 dae bewei waartydens die ooie ook gelam het. Vier groepe bestaande uit 25 ooie het 'n 17 ha kamp teen 'n weidigtheid van 5.8 ooie/ha bewei en die ander vier groepe bestaande uit 15 ooie het 'n 12 ha kamp teen 'n weidigtheid van 5.0 ooie/ha bewei. 'n Kombinasie energie/proteïen aanvulling in die vorm van 'n lek is aan die ooie beskikbaar gestel. Twee van die groepe het geen aanvullende voeding ontvang nie (kontrole), twee groepe het 200 g/dag/ooi ontvang, twee groepe het 400 g/ooi elke tweede dag ontvang en twee groepe het 600 g/ooi elke derde dag ontvang. Die kleinste daling in liggaamsgewig tydens die voerperiode is waargeneem in die ooie wat elke dag sowel as elke tweede dag byvoeding ontvang het, alhoewel geen betekenisvolle verskille tussen dié twee groepe waargeneem is nie. Die kleinste daling in gewig tydens die totale voerperiode is waargeneem in die drie groepe wat byvoeding ontvang het ($P < 0.1$) terwyl die groepe wat geen byvoeding ontvang het nie (kontrole) die meeste gewig tydens dieselfde periode verloor het. Al die groepe wat byvoeding ontvang het, se liggaamsmassa verandering oor die voerperiode asook die totale periode was betekenisvol beter as die kontrole groep Geen betekenisvolle verskille is gevind by lampersentasie, speenpersentasie, geboortegewig, 42-dae gewig en oorlewing van lammers nie. Daar is bevind dat die byvoeding aan ooie elke derde of elke tweede dag ekonomies geregverdig is en 'n moontlike afname in arbeid- en vervoerkostes mag meebring.

In die tweede studie is die invloed van weidigtheid op die samestelling van kanolastoppel en die produksie van SAVM-ooie op hierdie tipe stoppel ondersoek. Agt-en-veertig ooie is ewekansig in vier groepe verdeel en het kanolastoppel teen 'n weidigtheid van ongeveer 1.5, 3.5, 5.5 en 7.5 ooie/ha vir 152 dae bewei. Die ooie het geen byvoeding ontvang nie en is elke 14 dae geweeg. Die ooie het gelam vanaf die laaste week in Maart 1997 tot die eerste week in Mei 1997. Die lammers is met geboorte geweeg en daarna elke 14 dae. Stoppelmonsters van die kampe is versamel gedurende die eerste deel van die studie (Januarie en Februarie) asook aan die einde van die studie (April en Mei) deur tien kwadrate per kamp te sny en is daarna ontleed vir droë materiaal (DM), ruproteïen (RP), suur bestande vesel (SBV), neutraal bestande vesel (NBV) en *in vitro* verteerbaarheid van organiese materiaal (IVVOM). Die liggaamsgewig van die ooie teen 'n weidigtheid van 5.5 ooie/ha het betekenisvol afgeneem, terwyl die ooie teen die weidigtheid van 1.5 ooie/ha toegeneem het in massa. Die ooie teen 'n weidigtheid van 3.5 ooie/ha het die kleinste gewigsverlies getoon ($P = 0.01$). Die geboortegewig van die lammers is nie betekenisvol deur weidigtheid beïnvloed nie. Die RP-konsentrasie van die stoppel het afgeneem met 'n toename in weidigtheid, terwyl die SBV en NBV-konsentrasie van die monsters betekenisvol hoër was by die hoër weidigtheid.

In die derde studie is die byvoeding van rumen inerte vet of stysel aan ooie wat koringstoppel bewei ondersoek. Ses-en-vyftig SAVM ooie is ewekansig in vier groepe van 14 elk verdeel en het koringstoppel teen 'n weidigtheid van 4.6 ooie/ha bewei. Elke groep het daagliks byvoeding teen 250 g/ooi tydens die laaste ses weke van dragtigheid ontvang, waarna dit vermeerder is tot 360 g/ooi tydens die eerste vier weke van laktasie. Byvoeding is op Maandae, Woensdae en Vrydae vir 70 dae voorsien. Die RP-konsentrasie van die byvoeding het gevarieer tussen 16.7 % en 19.6 % terwyl die totale verteerbare voedingstof (TVV) konsentrasie gevarieer het tussen 52.0 % en 76.7 %. Daar was geen betekenisvolle verskille ($P > 0.05$) tussen die liggaamsmassa van die ooie gedurende die laaste ses weke van dragtigheid, die eerste vier weke van laktasie, of die totale voerperiode nie. Die ooie in die 50 % vet plus 50 % mieliemeel groep het minder gewig ($P \leq 0.08$) gedurende laktasie verloor as die ooie wat mieliemeel as hulle hoof energiebron ontvang het. Die studie het getoon dat daar geen betekenisvolle toename in die liggaamsgewig van die ooie tydens die eksperimentele periode was in vergelyking met die groep wat koringsemels (kontrole) ontvang het nie.

In die vierde studie is die ekonomiese voordeel van byvoeding vir SAVM ooie wat koring- of hawerstoppel bewei het ondersoek. Driehonderd-en-sestien ooie is in vier groepe

verdeel,waarvan twee hawerstoppel en twee koringstoppel bewei het. Elk van hierdie vier groepe is herverdeel in vier subdivisies waarvan twee byvoeding ontvang het en twee geen. Vier subdivisies het 200 g/d vir 83 dae ontvang, terwyl die ander vier subdivisies 200 g/d vir 44 dae ontvang het, waarna dit verhoog is na 300 g/d vir 37 dae ('n totaal van 81 dae). Die ooie is maandeliks geweeg. Die finale liggaamsgewig van die ooie wat byvoeding ontvang het betekenisvol hoër was as die ooie wat geen byvoeding ontvang het nie. Tydens die voerperiode het die ooie wat byvoeding ontvang het 'n betekenisvolle laer gewigsverlies getoon in vergelyking met die ooie wat geen byvoeding ontvang het nie. Die 42-dae gewig van die lammers het ook betekenisvol toegeneem, maar geen verskil is waargeneem in die geboortegewig, speengewig en oorlewingstempo van lammers wie se moeders byvoeding ontvang het nie.

In die vyfde studie is die invloed van byvoeding aan ooie en kruipvoeding aan hulle lammers op die produksie van beide die ooie en lammers bestudeer. Eenhonderd-agt-en-sestig ooie is onderskeidelik in twee groepe van 68 en 100 verdeel wat twee kampe van 12.9 en 18 ha respektiewelik bewei het. Elkeen van hierdie groepe is onderverdeel in vier groepe waarvan twee groepe byvoeding ontvang het en twee groepe geen. Binne elke ooi groep het twee groepe lammers kruipvoeding ontvang en twee geen. 'n Twee (byvoeding aan ooie) by twee (kruipvoeding aan lammers) faktoriaal ontwerp is gebruik. Byvoeding aan die ooie is verskaf teen 200 g/d vir die eerste 69 dae en 300 g/d vir die volgende 120 dae. Lammers het 0.58 kg kruipvoer per dag vir 96 dae ontvang. Daar is bepaal dat die liggaamsgewig-verandering van die ooie gedurende die eksperimentele periode nie betekenisvol beïnvloed is deur kruipvoeding van die lammers nie. Ooie wat byvoeding ontvang het het 'n hoer liggaamsgewig vir die grootste deel van die voerperiode gehandhaaf, alhoewel die finale gewigte aan die einde van die eksperimentele periode nie betekenisvol verskil het nie. Die gemiddelde daaglikse toename (GDT) van die lammers wie se moeders byvoeding ontvang het, het geneig om hoër te wees as die lammers wie se moeders geen byvoeding ontvang het nie, terwyl die GDT van die lammers wat kruipvoeding ontvang het was betekenisvol hoër as die lammers wat geen kruipvoeding ontvang het nie.

In die sesde studie is die oordrageffek van byvoeding in die vorige jaar op ooie se produksie in die opvolgende jaar ondersoek. Driehonderd-en-sestien ooie is in vier groepe verdeel,waarvan twee hawerstoppel en twee koringstoppel bewei het. Elk van hierdie vier groepe is herverdeel in vier subdivisies waarvan twee byvoeding ontvang het en twee geen. Vier subdivisies het 200 g/d vir 83 dae ontvang, terwyl die ander vier subdivisies 200 g/d vir 44 dae ontvang het, waarna dit verhoog is na 300 g/d vir 37 dae ('n totaal van 81 dae). Die ooie is maandeliks geweeg. Resultate

het aangedui dat die geboortestatus (lammers gebore/ ooie gepaar) van lammers 'n tendens getoon het om toe te neem in 1999 as gevolg van byvoeding in 1998, terwyl speenstatus nie betekenisvol beïnvloed is nie. Byvoeding in 1998 het die geboortegewig en speengewig van lammers verlaag omdat dit 'n groter aantal meerlinggeboortes veroorsaak het. Die studie het bevind dat byvoeding in die vorige jaar nie 'n betekenisvolle oordrageffek in die volgende jaar teweeg gebring het nie. Die resultate mag egter beïnvloed gewees het deurdat volwasse diere in die studie gebruik is, terwyl die beskikbaarheid van weiding tydens die stadium wanneer die ooie nie gereproduseer het nie ook die moontlike oordrageffek kon beïnvloed het.