Short Communications

Effect of level of supplementary feeding on mohair production and reproductive performance of Angora ewes grazing *Atriplex nummularia* (Oldman saltbush)

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Pregnant, adult Angora ewes, supplemented with either 0, 200, 400 or 600 g of alkali-ionophore treated whole maize per ewe per day were kept on *Atriplex nummularia* pasture for the entire gestational period. Changes in live bodymass, reproductive performance, and various mohair traits were recorded. Live bodymass gain during gestation was closely related to the amount of supplementation provided and highly significant differences ($P < 0,01$) occurred between all groups, except between the groups receiving 200 and 400 g alkali-ionophore-treated whole maize respectively. No significant differences in the recorded mohair traits occurred between the various groups. Although the results suggest that pregnant Angora ewes could maintain pregnancy on *A. nummularia* only, such animals run a relatively high risk of abortion especially during adverse weather conditions such as cold and wet spells. Supplementation of ewes on *A. nummularia* at a rate of approximately 300 g alkali-ionophore-treated whole maize per head per day is indicated.

Dragtige volwasse Angorabokooie, wat daagliks byvoeding ontvang het van 0, 200, 400 of 600 g alkali-ionofoor-behandelde heelmielies per ooi is op *Atriplex nummularia*-weiding aangehou vir die duur van dragtigheid. Veranderinge in lewende liggaamsmassa, reproduktiewe prestasie en verskeie sybokhaareienskappe is aangeteken. Lewende liggaamsmassa was hoogs verwant met die hoeveelheid byvoeding aangebied, en hoogs betekenisvolle verskille ($P < 0,01$) is aangeteken tussen alle groepe, behalwe tussen die groepe wat 200 en 400 g alkali-ionofoor-behandelde heelmielies respektiewelik ontvang het. Geen betekenisvolle verskille is in die aangetekende sybokhaareienskappe tussen groepe gevind nie. Ten spyte daarvan dat die resultate aandui dat dragtige Angorabokooie dragtigheid op *A. nummularia* kan onderhou, kan aanvaar word dat hierdie diere 'n hoë aborsie-risiko ondergaan, veral ten tye van gure weeromstandighede soos koue en nat toestande. Byvoeding van ongeveer 300 g alkali-ionofoor-behandelde heelmielies per ooi per dag op *A. nummularia*-weidings word aangedui.

Keywords: Angora goats, *Atriplex nummularia*, supplementation

The cultivation of drought fodder crops as a fodder reserve to overcome periodic droughts is a highly recommended practice in semi-arid areas. *Atriplex nummularia* (Oldman saltbush) has proved to be a very useful drought fodder crop for bridging the periods when the natural pasture does not satisfy the nutritional requirements of small stock. Although the protein content (21%) of *A. nummularia* is relatively high (Jacobs & Smit, 1977), the energy content (6,1 MJ/kg) is relatively low (Jacobs, unpublished data). As a result of the latter limitation, it is generally accepted that *A. nummularia* will provide a maintenance diet only for woolled sheep. No experimental results exist on the performance of Angora goats grazing *A. nummularia*. As Angora goats are known to be sensitive to an energy deficiency, especially in the reproducing ewe where such a deficiency is usually manifested by the incidence of abortion (Wentzel, Viljoen & Botha, 1979), it is reasonable to assume that *A. nummularia* will not satisfy the pregnant goats' energy requirements. This experiment was therefore undertaken to establish the optimal level of energy supplementation required for reproducing ewes grazing *A. nummularia*.

Within 30 days after mating (mid-April), 32 newly shorn, adult Angora ewes were randomly allocated to the treatment groups given in Table 1.

Table 1 Amount of supplement offered and consumed by pregnant Angora ewes grazing *Atriplex nummularia*

	Treatment Groups			
Item	1	2	3	4
Supplement offered (g/ewe/day)	0	200	400	600
Supplement consumed (g/ewe/day)	0	199,8 ± 0,5	391,9 ± 13,1	530,0 ± 54,4

Paddocks were kept free of growth other than *A. nummularia* by cutting the growth down with a slasher before animals were introduced to a new paddock. After almost all the leaves of bushes in a paddock had been grazed, animals were moved to the next paddock.

Alkali-ionophore-treated whole maize, containing 1% urea, was prepared as described by Gevers & Wentzel (1985). Experimental animals received their supplements every morning in individual pens and after two hours feed residues were recorded. Live bodymass was recorded at weekly intervals. Animals were kept on *A. nummularia* pasture for the entire gestational period, after which they were shorn. The following mohair parameters were recorded for each animal using standard techniques : greasy fleece mass, clean fleece mass, percentage clean yield, fibre diameter, straight fibre length, percentage sweat and pH of the sweat. Reproductive data collected, included birth status, birth mass of kids and number of abortions.

Considerable differences in live bodymass occurred between animals in the same group carrying either twins or singles. These differences were corrected for by using linear regression equations. Changes in live bodymass of the various groups are shown in Figure 1.

From Figure 1 it is apparent that the mass gain of animals was related to the amount of supplement provided. All experimental groups showed a progressive gain in live bodymass over the gestational period (Table 2).

No significant differences occurred between the various groups for all mohair traits measured (Table 3).

From Table 4 it is apparent that the average birth mass of kids born in Group 4 (600 g supplementation) were significantly

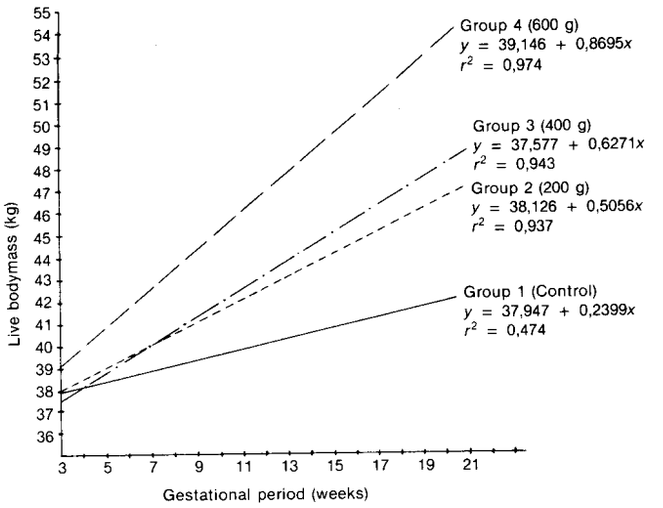

Figure 1 Effect of level of supplementation on changes in live bodymass of pregnant Angora ewes grazing *A. nummularia*

Table 2 Effect of level of supplementation on changes in live bodymass of pregnant Angora ewe grazing *Atriplex nummularia*

Gestational period (Weeks)	Amount of alkali-ionophore-treated whole maize supplemented (g/ewe/day) 0	200	400	600
3	40,1 ± 6,2	39,7 ± 3,3	39,0 ± 2,6	39,0 ± 5,4
6	39,4 ± 5,9	40,0 ± 2,2	39,9 ± 3,0	41,0 ± 5,1
9	39,4 ± 5,2	41,6 ± 3,2	42,2 ± 3,1	43,7 ± 5,4
12	38,9 ± 5,9	42,1 ± 3,0	42,6 ± 2,9	45,0 ± 6,0
15	41,3 ± 6,2	45,6 ± 4,2	46,4 ± 3,7	49,0 ± 7,2
18	41,4 ± 6,6	45,6 ± 3,6	46,4 ± 3,8	49,0 ± 7,9
21	42,4 ± 7,0	47,6 ± 4,8	49,5 ± 3,9	50,8 ± 8,3
Significance ($P < 0,01$)	a	b	b	c

higher ($P < 0,01$) than those in Groups 1 (no supplementation) and 2 (200 g supplementation).

From the results it is apparent that live bodymass gain during gestation was strongly related to the amount of supplementation provided (Figure 1). This is indicated by the highly significant differences ($P < 0,01$) in live bodymass gains between all groups except between Groups 2 (200 g) and 3 (400 g). Whilst the control group showed a 5,7% increase in live bodymass over the gestational period, Group 4 (600 g) had a 30,45% increase in bodymass. These relatively large differences in live bodymass gain as a result of mainly energy supplementation, support earlier findings (Jacobs, unpublished data), indicating that *A. nummularia* pasture fails to meet the energy requirements of reproducing small stock.

Although the rate of supplementation had no significant effect on mohair production or characteristics, partially owing to the large individual variation among experimental animals, the results tend to indicate a slightly higher production in supplemented groups. These results also suggest that live bodymass is more sensitive to an energy-deficient diet than mohair production.

Results pertaining to the reproductive outcome of the experimental animals suggests that pregnant goats could satisfy their energy requirements for the maintenance of pregnancy on *A. nummularia* pasture. However, such animals run a relatively high risk of aborting, especially if increases occur in the demand for energy e.g. during cold spells and after shearing.

Table 3 Effect of level of supplementation on mohair production and characteristics of Angora ewes grazing *Atriplex nummularia*

Measurement	Amount of alkali-ionophore-treated whole maize supplemented (g/ewe/day) 0	200	400	600
Greasy fleece mass (kg)	1,5 ± 0,5	1,8 ± 0,4	1,8 ± 0,7	1,6 ± 0,2
Clean fleece mass (kg)	1,2 ± 0,4	1,5 ± 0,4	1,5 ± 0,5	1,4 ± 0,2
Percentage clean yield	82,2 ± 4,6	80,8 ± 4,4	81,2 ± 6,8	86,0 ± 3,2
Fibre diameter				
Tip (μm)	33,4 ± 3,2	37,6 ± 3,4	37,0 ± 3,4	38,4 ± 5,1
Root (μm)	35,3 ± 3,9	36,2 ± 3,4	36,5 ± 3,4	37,9 ± 5,6
Straight fibre length (cm)	15,3 ± 0,8	15,9 ± 1,0	16,0 ± 1,1	16,1 ± 0,8
Percentage sweat	0,7 ± 0,3	0,8 ± 0,2	0,9 ± 0,5	0,7 ± 0,3
pH of sweat	6,4 ± 0,1	6,4 ± 0,4	6,4 ± 0,1	6,4 ± 0,3

Table 4 Effect of level of supplementation on the reproductive performance of Angora ewes grazing *Atriplex nummularia* during gestation.

Item	Amount of alkali-ionophore-treated whole maize supplemented (g/ewe/day) 0	200	400	600
Number of ewes	8	8	8	8
Number pregnant	8	8	8	6
Number aborted	1	–	–	–
Number of twins	3	5	5	5
Number of singles	4	3	3	1
Average birth mass (kg)	$3,2^{a}$	$3,2^{a}$	$3,5^{ab}$	$3,7^{b}$

[a,b] Means within the same line bearing different superscripts differ highly significantly ($P < 0,01$)

The fact that supplementary feeding had a significant ($P < 0,01$) influence on birth mass of kids, indicates that *A. nummularia* alone, will not supply the energy required by pregnant Angora ewes for optimal foetal growth.

In conclusion, the results of this trial show that *A. nummularia* is a valuable source of fodder for reproducing Angora goats. Supplementation of ewes at a rate of approximately 300 g of alkali-ionophore-treated whole maize per ewe per day, should optimize reproduction by reducing the risk of abortion in Angoras grazing this pasture.

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