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RESEARCH NOTE

CONDITION SCORING AS A GUIDE TO THE NUTRITIONAL STATUS OF THE BEEF COW AND ITS IMPLICATIONS IN REPRODUCTIVE PERFORMANCE

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To remain in the breeding herd, a cow should produce and successfully raise a calf each year and reconceive within 90 days of parturition. To ensure that the cow has the best possible chance of fulfilling these requirements the cow must be in optimum condition at the onset of winter, at parturition and at mating.

Many researchers have suggested that the breeding cow should be on a rising plane of nutrition and gaining mass during the mating season to ensure a large claf crop (McClure, 1965; Wiltbank *et al.*, 1964; Preston & Willis, 1974). However, a study by Richardson, Oliver & Clarke (1976) demonstrated that the ability of an animal to conceive was a function of body mass *per se* and not rate of gain during the mating season. Economic factors dictate that the minimum body mass and consequent body condition compatible with normal fertility must be established to optimize nutrition (Lamond, 1970).

Winter nutrition often exerts the greatest influence on production in the beef cow. The high cost of supplementary feeding may result in cows being underfed during the middle and late stages of pregnancy. The matter is often confused by the fact that a gestating cow may be gaining mass and yet losing condition. This is due to the growth of the foetus and a considerable enlargement of the uterus and associated membranes. In a cow weighing 450 kg, the uterus and contents may weigh 8–9 kg at 20 weeks gestation, 25 kg at 30 weeks and very nearly 70 kg at 40 weeks (Moustgaard, 1959). This increase in foetal development is often confounded with an increase in mass due to improved nutrition.

The term "condition" is a vague one and reference made to a "thin cow" or a cow in "good condition" is open to interpretation. Therefore, the need exists for a means whereby the physical condition of an animal can be assessed and described with relative ease and be widely understood. A number of means of assessing body condition have been proposed and used successfully. Condition scoring by prediction equation (Yadava, 1970), measurement of subcutaneous fat thickness ultrasonically using a scanogram (Stouffer *et al.*, 1961; Hendrick *et al.*, 1962; Davis *et al.*, 1964) and other systems which all require either a certain amount of skill, specialized equipment or are time consuming. A condition scoring system for assessing the body condition of the cow was proposed by Lowman, Scott & Somerville (1973). This system was adopted and modified by Van Niekerk & Louw (1980), using a 9 point scale with halfpoint increments, where, 1,0 represents an emaciated animal and 5,0 an extremely fat animal. The system is easily learned and Croxton & Stollard (1976) found that it is highly repeatable both within and between operators where intraclass correlations of between 0,8 and 0,9 were obtained.

The data presented in this paper were obtained from research conducted at the Thabamhlope Research Station situated at an altitude of 1 500 m above sea level and representative of Highland Sourveld. The breeding season extends from the 15th of November to 15th of January each year. Simmenthaler bulls are used.

The results in Table 1 indicate the possibility of an inverse relationship between mass gain and condition score change on summer veld. This factor has a significant influence on the feeding régime employed during the subsequent winter. The results were obtained from an experiment in which 120 lactating Sussex cows and 60 replacement Simmenthaler heifers were subjected to different stocking rates on Highland Sourveld.

Despite the fact that cows in 4 of the 6 treatments (stocking rates) gained mass, they all lost condition (Table 1) . When the cows lost mass, condition fell dramatically (Tr. 5 & 6; Table 1). The performance of the calves is consistent with that of their dams. The trend is continued in the replacement heifers, where all the heifers gained mass, but lost condition in proportion to their mass change (Table 1).

Table 1

Mass and condition score changes of lactating cows, their calves and replacement heifers on summer veld

	Stocking rate (A.U./ha)					
	0,83	1,00	1,00	1,25	1,67	1,67
Lick supplementation	Mineral Tr. 1	Mineral Tr. 2	Energy Tr. 3	Mineral Tr. 4	Mineral Tr. 5	Energy Tr. 6
Lactating cows:	n=20	n=20	n=20	n=20	n=20	n=20
Mean mass change (kg)	+ 21,9	+ 17,9	+ 42,2	+ 17,2	− 15,3	− 25,4
Mean CS change	− 0,4	− 0,7	− 0,3	− 0,6	− 0,9	− 1,0
Calves:						
Mean mass (kg)	121,1	116,2	125,9	120,8	92,5	83,7
Replacement heifers:	n=10	n=10	n=10	n=10	n=10	n=10
Mean mass (kg)	71,7	95,7	93,9	83,4	41,0	41,4
Mean CS change	− 0,3	− 0,2	− 0,3	− 0,5	− 0,6	− 0,8

Table 2

Intake and performance data of cows during winter

	Condition score			
	1,0–1,5	2,0	2,5	3,0
	n=16	n=26	n=28	n=22
	Tr. 1	Tr. 2	Tr. 3	Tr. 4
No. of days to reach next ½ score	19,8	24,3	30,3	–
No. of cows to reach 3,0 (%)	12,5	15,3	42,8	–
DM intake/cow/day (kg)	8,66[a]	6,53[b]	6,88[b]	6,40[b]
Feed cost for 120 days (4c/kg DM)	R41,57	R31,34	R33,02	R30,72
Mean calf birth mass (kg)	35,11[a]	30,17[b]	30,38[b]	30,83[b]
Value of calf (80,48c/kg)	R28,26	R24,28	R24,46	R24,81

Rows having different superscripts differ significantly, $P<0,01$.

To determine the time and amount of feed required during winter to achieve a condition score of 3,0 by parturition or by the end of winter, both gestating and dry cows were allocated to different treatments, on the basis of their condition, and fed *ad lib.* rations of maize silage and *E. curvula* hay. The very thin cows (CS 1,0 – 1,5) consumed significantly ($P<0,01$) more dry matter and produced calves significantly ($P<0,01$) heavier at birth than the cows in the other 3 treatments (Table 2). The fact that only 12,5% of the cows in Tr. 1 achieved the desired condition score of 3,0 is probably due to insufficient energy. However, by supplementing the ration with energy, the desired condition score of 3,0 would be achieved at a considerably greater cost than is indicated in Table 2.

The deciding factor in determining the winter feeding régime is that the cows must be in optimum condition at parturition and consequently at mating if the cow is to reconceive. An examination of Thabamhlope breeding data has shown that only 8% of the cows that went to the bull at a condition score of 1,5 produced a calf, compared with 43% at a CS of 2,0, 64% at a CS of 2,5 and 78% at a CS of 3,0. These results are dealt with in more detail in a subsequent paper.

Condition scoring has shown to be a useful management tool in improving production. The quantifying of target condition scores at parturition and mating have simplified winter feeding strategies and improved reproductive performance. Current research at Thabamhlope is being directed at determining precise winter feeding requirements for cows in different conditions, the effect of cow condition at mating on calving interval and the effect of undernutrition on reproductive performance.

References

CROXTON, D. and STOLLARD, Rosalyn, J., 1976. Use of condition scoring as a management aid in dairy and beef herds. *Anim. Prod.* 22, 146 (Abstr.).

DAVIS, J.K., LONG, R.A., SAFFLE, R.L., WARREN, E.P. and CARMAN, J.L., 1965. Use of ultrasonics and visual appraisal to estimate total muscling in beef cattle. *J. Anim. Sci.* 23, 638.

HALE, D.H., 1975. Nutrition, hormones and fertility. *Rhod. agric. J.* 72, 69.

HENDRICK, H.B., MEYER, W.E., ALEXANDER, M.A., ZOBRISKEY, S.E. and NAUMANN, H.D., 1962. Estimation of ribeye area and fat thickness of beef cattle with ultrasonics. *J. Anim. Sci.* 21, 362.

KILKENNY, J.B., 1978. Reproducture performance of beef cows. *World Rev. Anim. Prod.* 16, 65.

LAMOND, D.R., 1970. The influence of undernutrition on reproduction in the cow. *Anim. Breed. Abstr.*, 38, 359.

LOWMAN, B.G., SCOTT, N.A. and SOMERVILLE, S.H. 1976. Condition scoring of cattle. Bulletin No. 6. East of Scotland College of Agriculture, Edinburgh.

MOUSTGAARD, J., 1959. *In Reproduction in Domestic Animals.* Ed. by H.H. Cole and P.T. Cupps, New York and London : Academic Press.

PRESTON, J.R. and WILLIS, M.B., 1974. *Intensive Beef Production.* New York : Pergaman Press.

RICHARDSON, F.D., OLIVER, J. and CLARKE, G.P.Y., 1976. Analysis of some factors which affect the productivity of beef cows and their calves in a marginal rainfall area of Rhodesia. 1. Factors affecting calving rate. *Anim. Prod.*, 21, 41.

STOUFFER, J.R., WALLENTINE, M.V., WELLINGTON, G.H. and DIEKMANN, A., 1961. Development and application of ultrasonic methods for measuring fat thickmen and the eye area in cattle and hogs. *J. Anim. Sci.* 20, 759.

VAN NIEKERK, A. and LOUW, B.P., 1980. Condition scoring of beef cattle. Bulletin N2/80, Dept. Agric. and Fisheries, Natal Region.

YADAVA, R.K., 1970. The effect of body condition at calving upon the productivity of the dairy cow, Ph. D. Thesis, Ohio State University.