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A Guide to Condition Scoring of Zebu Cattle

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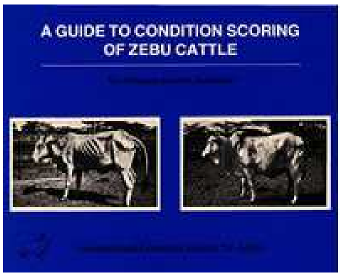

Contents:

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Photographs by M.J.Nicholson

Introduction

It is useful to quantify the extent to which cattle are affected by nutrition, disease or other environmental factors, especially when large fluctuations in the quantity and quality of available forage occur, as they do in seasonally dry tropical and subtropical areas.

Such monitoring is usually done by measuring changes in weight or heart girth, but these techniques have a number of disadvantages. First, weigh scales are cumbersome, expensive and difficult to transport. Second, weight *per se* does not reflect an animal's condition: an animal with a large frame may have a higher body weight when at a low level of body reserves than another animal with a small frame but abundant reserves; animals must therefore be individually identified to record seasonal weight change. Third, large variations in gross liveweight may occur as a result of changes in gut and bladder fill, pregnancy and parturition. Moreover, weight changes may reflect tissue hydration rather than significant alterations in body protein or fat content.

Measuring the heart girth requires that individual animals be restrained, and results vary according to posture, positioning and tension of the tape, coat thickness and gut fill. Weight estimation, and hence changes in body composition, may therefore be masked by small errors in technique if heart girth is used.

The nutritional plane to which an animal has been exposed over a reasonable length of time is reflected by the extent to which fat is stored or muscle mass has diminished. This may be assessed visually and expressed as a condition score.

Why Condition Scoring?

For those involved in cattle research in Africa, condition scoring provides a quick, cheap and easy method of comparing herds of cattle or individual animals under differing management systems, experimental treatments, seasons or environments. Large numbers of animals can be scored at a time without the need to handle them or use weigh scales. Condition scoring is a subjective assessment, but with practise a high level of repeatability and reproducibility can be obtained both between workers and between observations (Croxton and Stollard, 1976; Nicholson and Sayers, 1986a). The resulting data are useful both at the time of collection, to detect differences between groups, and over time, to disclose changes within groups.

The results also have practical importance for cattle productivity. Conception has been positively correlated with condition scores by several authors (Elliot, 1964; Ward, 1968; Harwin et al, 1967; Kilkenny, 1978). Steenkamp et al (1975) compared animals of differing condition scores but similar liveweight, and showed that condition at mating was more important than weight at mating for successful conception. Similar work was carried out by van Niekerk (1982), who allocated cows into groups according to condition score and found calving rates of 78% for animals in optimal condition compared with only 8% for cows in poorest condition. The interval from the start of the mating season to parturition decreased from 316 to 293 days as the condition of the cow improved. Pathiraja (personal communication) found that condition scores were useful for selecting farms for artificial insemination.

Reed et al (1974) reported a highly positive correlation between condition and resource availability (finance, management skill and grazing availability), indicating that condition scoring is useful not only for research scientists but also for farmers and development planners. Condition scoring cattle at slaughter has shown that, among animals of the same age and sex, liveweights, carcass weights and edible tissue yield are highly correlated with condition score. Thus those involved in marketing of live cattle would find condition scoring useful in estimating expected saleable meat (Kifaro, personal communication; Tanzanian Ministry of Livestock Development, 1982).

How to Condition Score

Several authors have described methods of allocating a score or index of body condition. The East of Scotland College of Agriculture (Lowman et al, 1976) produced a handbook describing a way of assessing the body condition of suckler cows, growing beef cattle and suckled calves of European breeds under temperate conditions. Buxton (1982) produced an index for dairy cattle in New Zealand using an 8-score system. However, these handbooks are not applicable for tropical breeds of cattle, which differ from temperate breeds in fat deposition. Moreover, the scales used do not cover a wide enough range of the poorer conditions seen in African livestock.

The different requirements of condition scoring for European and African cattle have been recognised by Pullan (1978) who described a method by which White Fulani cattle were scored on a scale from 0 to 5 in Nigeria, and van Niekerk and Louw (1980) who scored Afrikander cattle on a scale of five points, using half-point increments where a more accurate reflection of the animal's condition was necessary.

In the method described here for *Bos indicua* (zebu) cattle, nine scores are used in which the three main conditions- (fat [F], medium [M] and lean [L]) - are subdivided into three categories. The scores are abbreviated as F+, F, F-; M+, M, M-; L+, L and L-. Each scoring is given a number from 1 (L-) to 9 (F+). In a borderline case a half point is added to the lower score, so that a cow described as M-/L+ is scored as 3.5.

The following anatomical parts (Figure 1) are important in determining the score: tail-head, brisket and hump; transverse processes of the lumbar vertebrae, hips (trochanter major) and ribs; the shape of the muscle mass between the tuber coxae (hooks) and tuber ischii (pins): the worse the condition, the more concave the muscle becomes. In order to avoid confusion in identifying the parts, a few general comments are required. The vertebral column refers to the sum of all the vertebrae, which are divided into cervical (7), thoracic (13), lumbar (6), sacral (6 fused vertebrae forming the sacrum), and the coccygeal vertebrae (18-20) in the tail. Of these only the thoracic and the lumbar vertebrae are of importance for condition scoring. Ribs are attached to the thoracic vertebrae while the lumbar vertebrae have horizontal 'wings' (the transverse processes), and all 19 vertebrae have vertical processes known as dorsal spines or spinous processes. The sublumbar fossa is a triangular area under the transverse processes beneath which is the rumen on the left side. When the fossa is indented (see Figure 6), it does not necessarily mean that the animal's condition is poor but rather that gut contents (water or food) are at a low level.

The score of an animal depends on the visibility of the anatomical parts, and the flesh and fat cover at these points. A detailed description of how the different scores are assessed is given on page 6. Examples of cattle in the various categories used in this manual are given in Figures 2 - 10 a and b, showing side and rear views.

Cattle should preferably be scored early in the morning, having had no access to food or water overnight. The authors' experience has shown that watering significantly alters the assessment of condition scores, particularly where cattle are watered only every second or third day. All classes of cattle may be scored, but lactating cows are normally chosen as these are likely to be most affected by poor nutrition. Scoring has been found to be least reliable in the case of young calves and weaners, as growing animals tend not to have heavy deposits of fat.

Description of condition scores

Score	Condition	Features	(*Figures open in new window*)
1	L-	Marked emaciation (animal would be condemned at ante mortem examination). (Figures 2 and 11).	Fig 2 Fig 11
2	L	Transverse processes project prominently, neural spines appear sharply. (Figure 3).	Fig 3
3	L+	Individual dorsal spines are pointed to the touch; hips, pins, tail-head and ribs are prominent. Transverse processes visible, usually individually. (Figure 4).	Fig 4
4	M-	Ribs, hips and pins clearly visible. Muscle mass between hooks and pins slightly concave. Slightly more flesh above the transverse processes than in L+. (Figure 5).	Fig 5
5	M	Ribs usually visible, little fat cover, dorsal spines barely visible. (Figure 6).	Fig 6
6	M+	Animal smooth and well covered; dorsal spines cannot be seen, but are easily felt. (Figure 7).	Fig 7
7	F-	Animal smooth and well covered, but fat deposits are not marked. Dorsal spines can be felt with firm pressure, but feel rounded rather than sharp. (Figure 8).	Fig 8
8	F	Fat cover in critical areas can be easily seen and felt; transverse processes cannot be seen or felt. (Figure 9).	Fig 9
9	F+	Heavy deposits of fat clearly visible on tail-head, brisket and cod; dorsal spines, ribs, hooks and pins fully covered and cannot be felt even with firm pressure. (Figure 10).	Fig 10

How to Use the Data

The advantage of a nine-point system is that, provided the differentiation between scores is clearly observable and repeatable between observers, an approximation to a continuous distribution is achieved. A one-point difference in a five-score system represents a large step which could affect statistical interpretation if animal numbers are small.

The purpose of giving numbers to the conditions is to allow statistical analysis of the data and to facilitate codification on computer files. The 17 possible scores represent a discrete data set, but it can be assumed that condition scoring approximates continuously variable data if an analysis of variance is to be used. There is a high correlation between condition score and changes in body weight and heart girth. (Nicholson and Sayers, 1986b).

Table 1 gives mean condition scores of cows in a watering frequency experiment, in which the variables were season, physiological status of cows and watering frequency.

The treatment effect can be analysed using a one-way analysis of variance, seasonal differences can be tested using a paired 't'-test, while a oneway paired 't'-test can be used to examine differences between dry and lactating cows, either within treatments or grouped together.

The data are simple and easy to collect and more sensitive to change than weight data which are subject to large variations. In addition, weight is dependent on skeletal size, which may complicate the analysis.

Table 1. Mean condition scores of cows (±S.D.) in a watering frequency experiment, Abemossa, Ethiopia, 1984.

Treatment	Physiological status[A]	Mean condition score ± S.D.	
		End of rains	Late dry season
Daily watering	LC	7.16 ± 0.81	4.69 ± 1.35
	DC	7.56 ± 0.67	7.22 ± 0.97
	All	7.29 ± 0.94	5.60 ± 1.73
2-day watering	LC	6.92 ± 0.85	4.18 ± 0.75
	DC	6.93 ± 0.98	5.75 ± 1.28
	All	6.92 ± 0.89	4.71 ± 1.20
3-day watering	LC	5.69 ± 1.08	3.88 ± 0.72
	DC	6.84 ± 1.42	5.89 ± 1.61
	All	6.06 ± 1.53	4.60 ± 1.47

A: LC = lactating cows; DC = dry cows.

If the data are treated as discrete, a chi-squared test can be used with contingency tables or a log-linear model can be fitted to test for associations between scores and treatments or seasonal trends. Further details on the statistical interpretation of the data are given in Nicholson and Sayers (1986a; 1986b). Their analysis showed that a change of one condition score was equivalent to about 24 kg.

References

Buxton D A L. 1982. Dairy cattle condition scoring in farm production and practice. Ministry of Agriculture and Fisheries, New Zealand.

Croxton D and Stollard R J. 1976. The use of condition scoring as a management aid in dairy and beef cattle. *Anim. Prod.* 22: 146.

Elliot R C. 1964. Some nutritional factors influencing the productivity of beef cattle in southern Rhodesia. PhD thesis, University of London.

Harwin G O, Lamb R D and Bisschop J H R. 1967. Some factors affecting reproductive performance in beef females. In: *Proceedings of the South African Society of Animal Production* 6: 171.

Kilkenny B. 1978. Some factors affecting calving intervals of beef cows in commercial suckler herds. Paper No. 1, British Society of Animal Producers winter meeting, Harrogate, U.K.

Lowman B G, Scott N A and Somerville S H. 1976. Condition scoring of cattle. Bulletin No. 6, East of Scotland College of Agriculture, Animal Production, Advisory and Development Department.

Nicholson M J and Sayers A R. 1986a. Reliability, reproducibility and sequential use of condition scoring of *Bos indicus* cattle. *Trop. Anim. Health Prod.* (In press).

Nicholson M J and Sayers A R. 1986b. Relationships between body weight, condition score and heart girth changes in Boran cattle. *Trop. Anim. Health Prod.* (In press).

van Niekerk A. 1982. The effect of body condition as influenced by winter nutrition on the reproductive performance of the beef cow. *S. Afr. J. Anim. Sci.* 12: 383-387.

van Niekerk A and Louw B P. 1980. Condition scoring of beef cattle. Bulletin N2/80, Department of Agriculture and Fisheries, Natal Region, South Africa.

Pullan N B. 1978. Condition scoring of White Fulani cattle. *Trop. Anim. Health Prod.* 10: 118-120.

Reed J B H, Doxey D L, Forbes A B, Finlay R S, Geering I W, Smith S D and Wright J D. 1974. Productive performance of cattle in Botswana. *Trop. Anim. Health Prod.* 6: 23-29.

Steenkamp J D G, van der Horst C and Andrew M J A. 1975. Reconception in grade and pedigree Africander cows of different sizes: Post-partum factors affecting reconception. *S. Afr. J. Anim. Sci.* 5: 103—110.

Ward H K. 1968. Supplementation of beef cows grazing on veld. *Rhod. J. Agric. Res.* 6: 93-101.

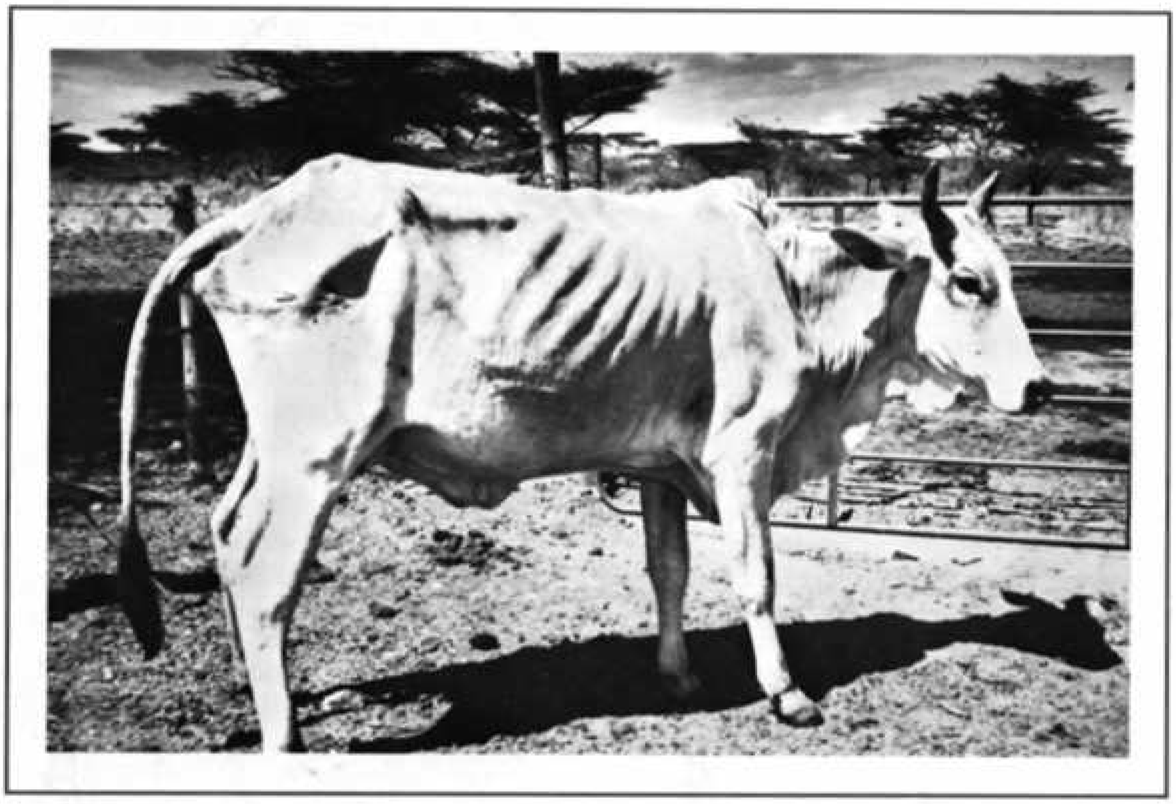
A GUIDE TO CONDITION SCORING OF ZEBU CATTLE

Figure 2

L-

Marked emaciation;
Animal would be condemned at ante mortem examination

A



B

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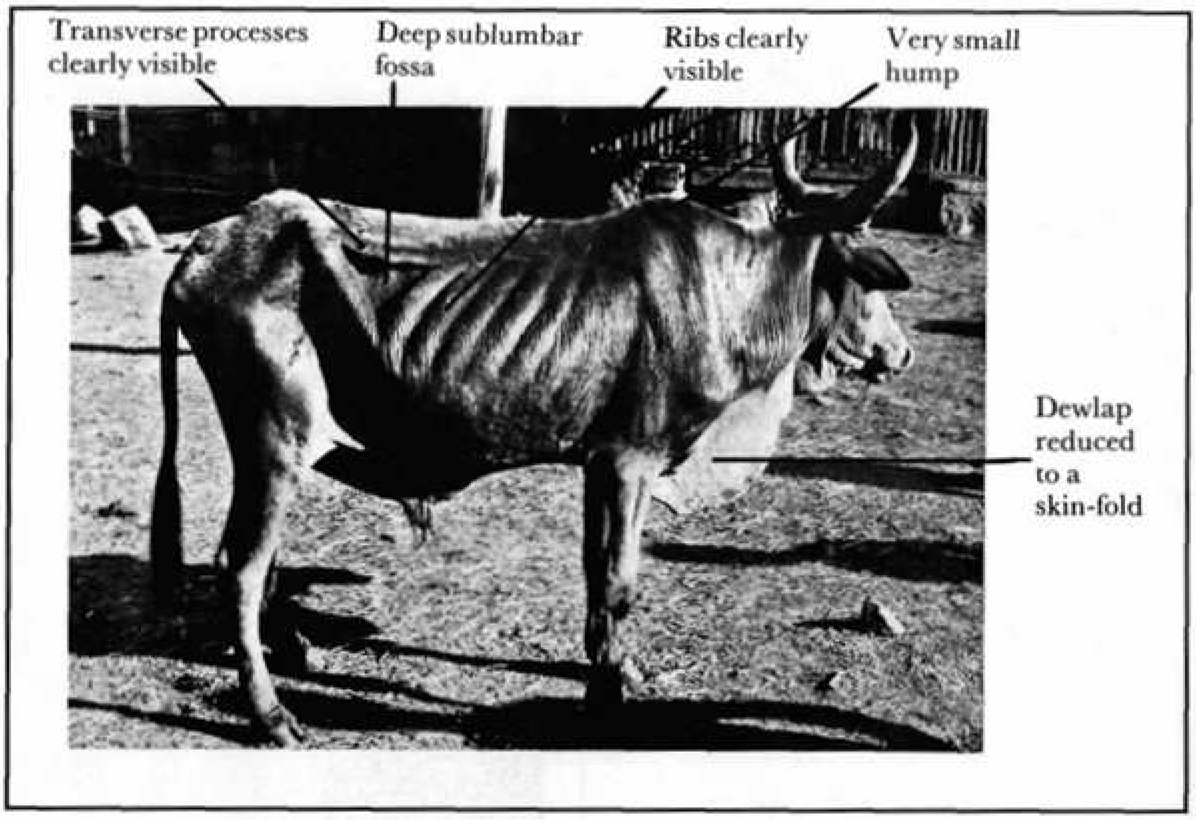
Figure 11

An emaciated steer

A



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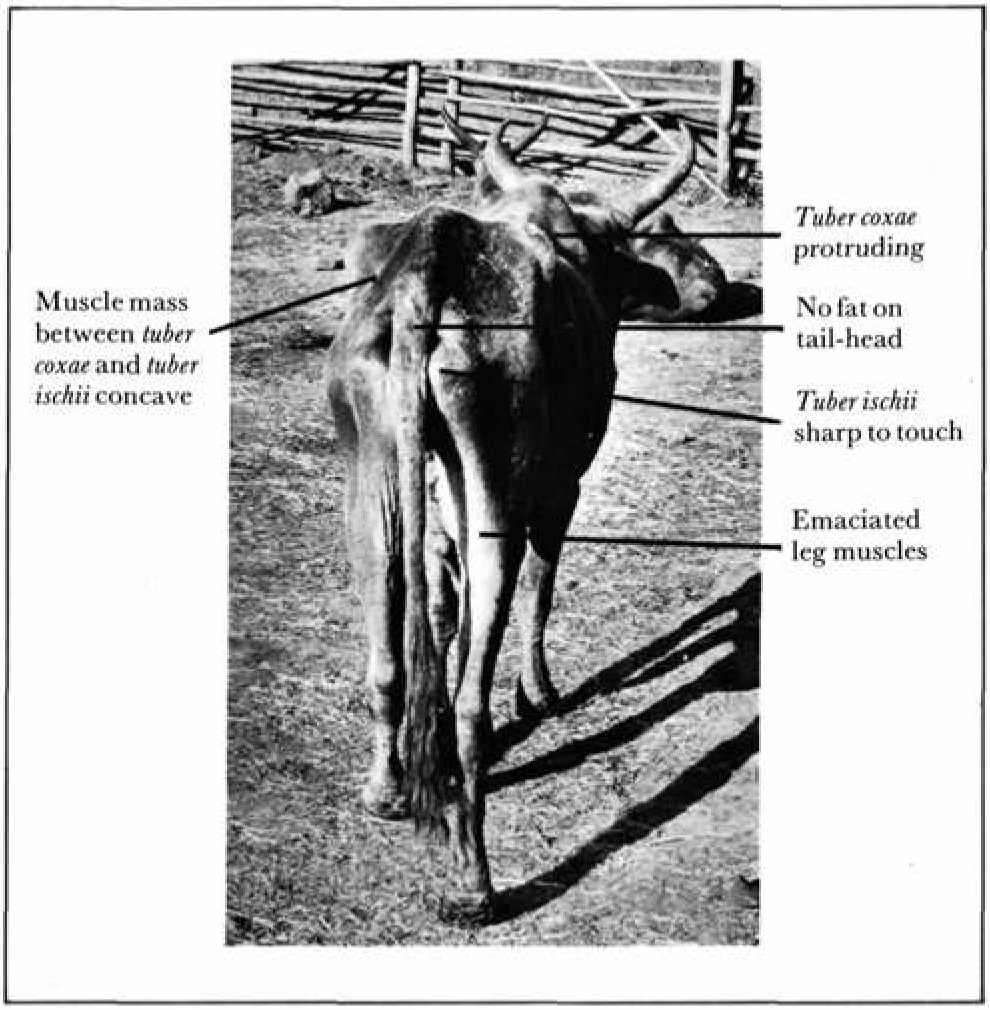
Muscle mass between *tuber coxae* and *tuber ischii* concave
Tuber coxae protruding
No fat on tail-head
Tuber ischii sharp to touch
Emaciated leg muscles

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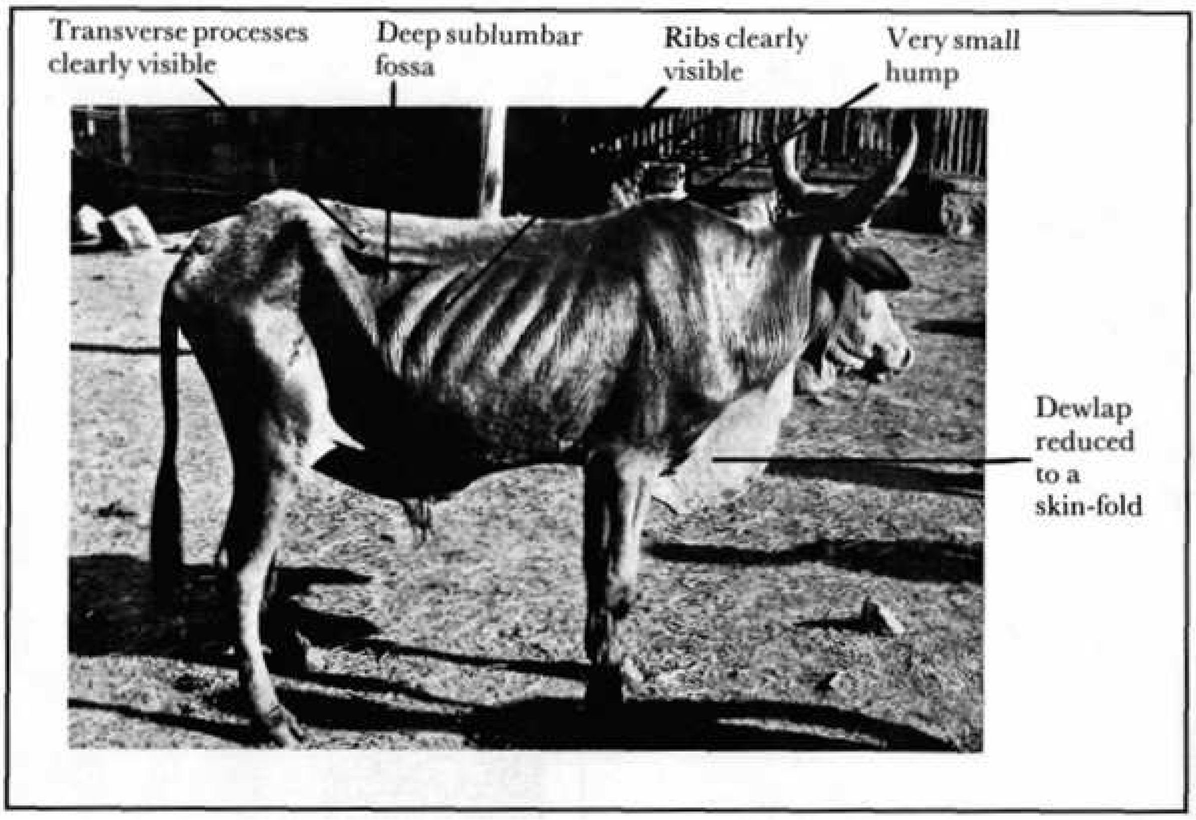
Figure 11

An emaciated steer

A



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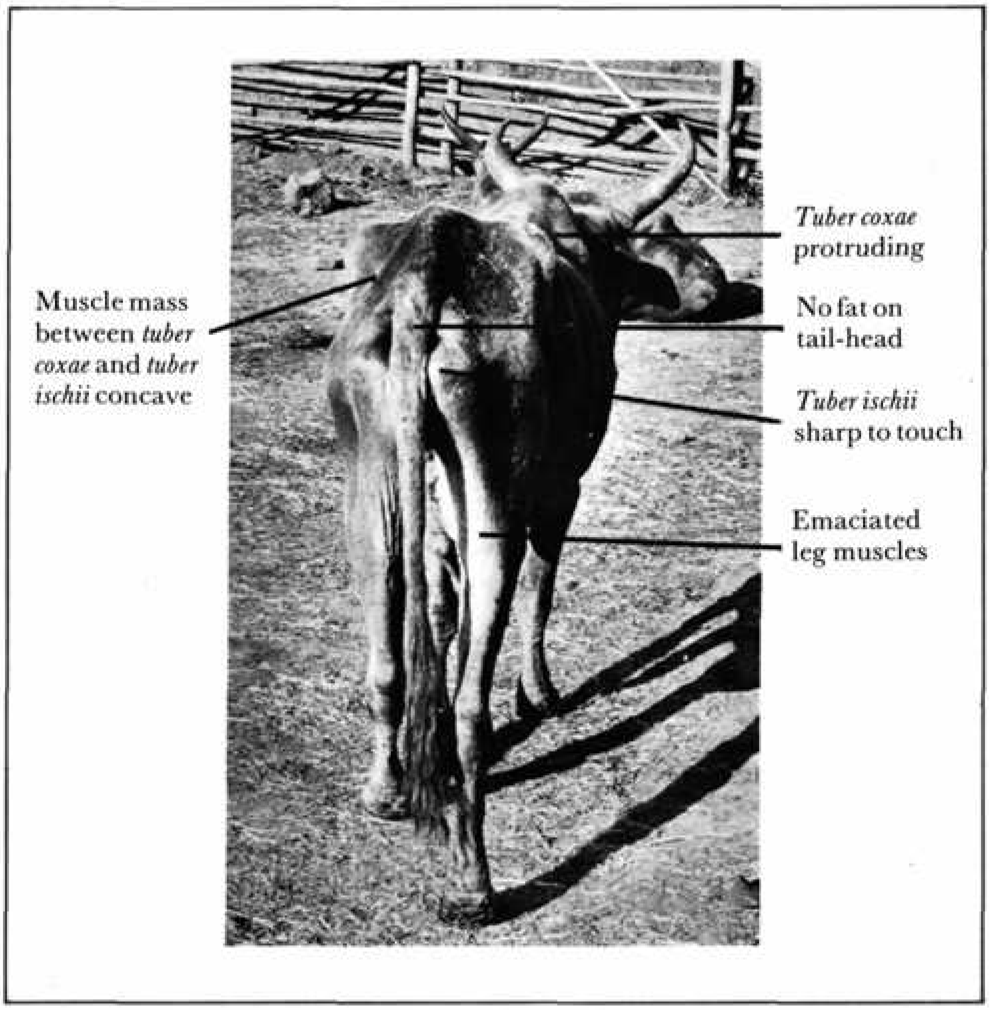
Muscle mass between *tuber coxae* and *tuber ischii* concave
Tuber coxae protruding
No fat on tail-head
Tuber ischii sharp to touch
Emaciated leg muscles

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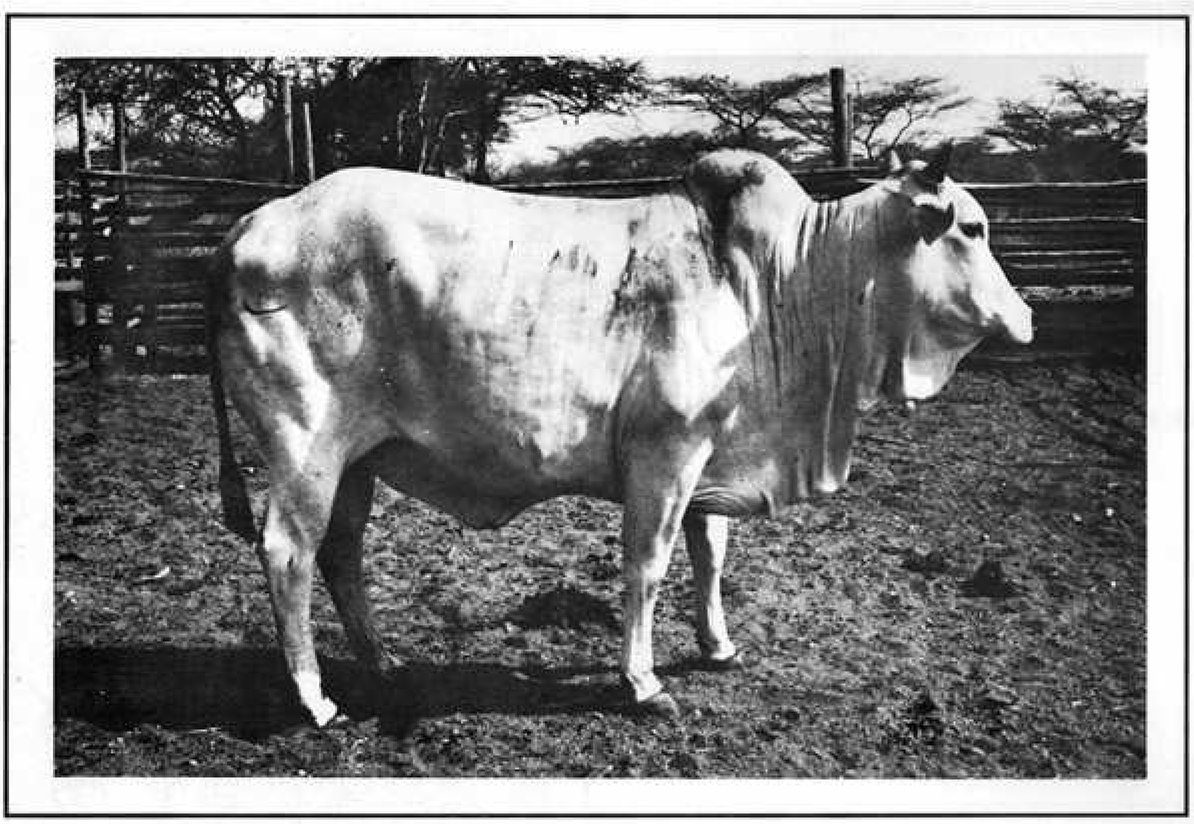
Figure 10

F+

Animal has heavy deposits of fat on tail-head, brisket and cod.

A



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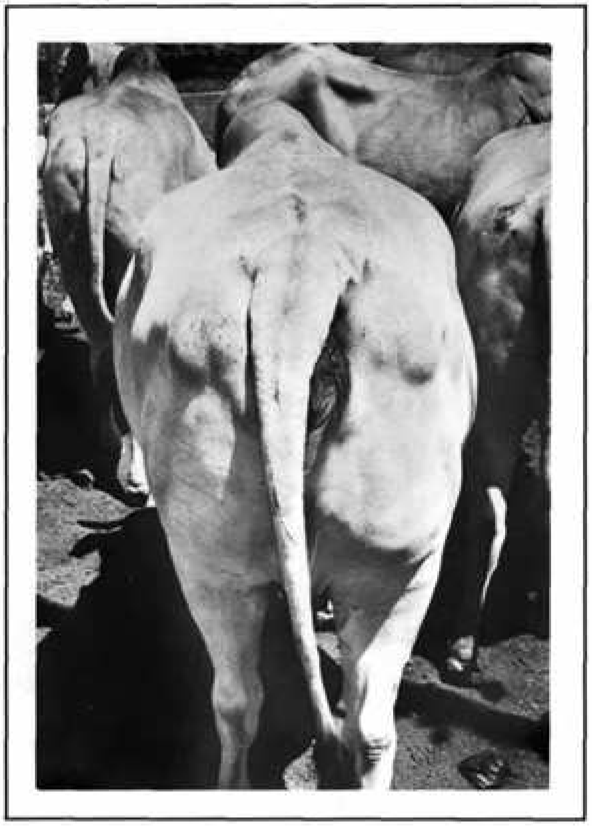

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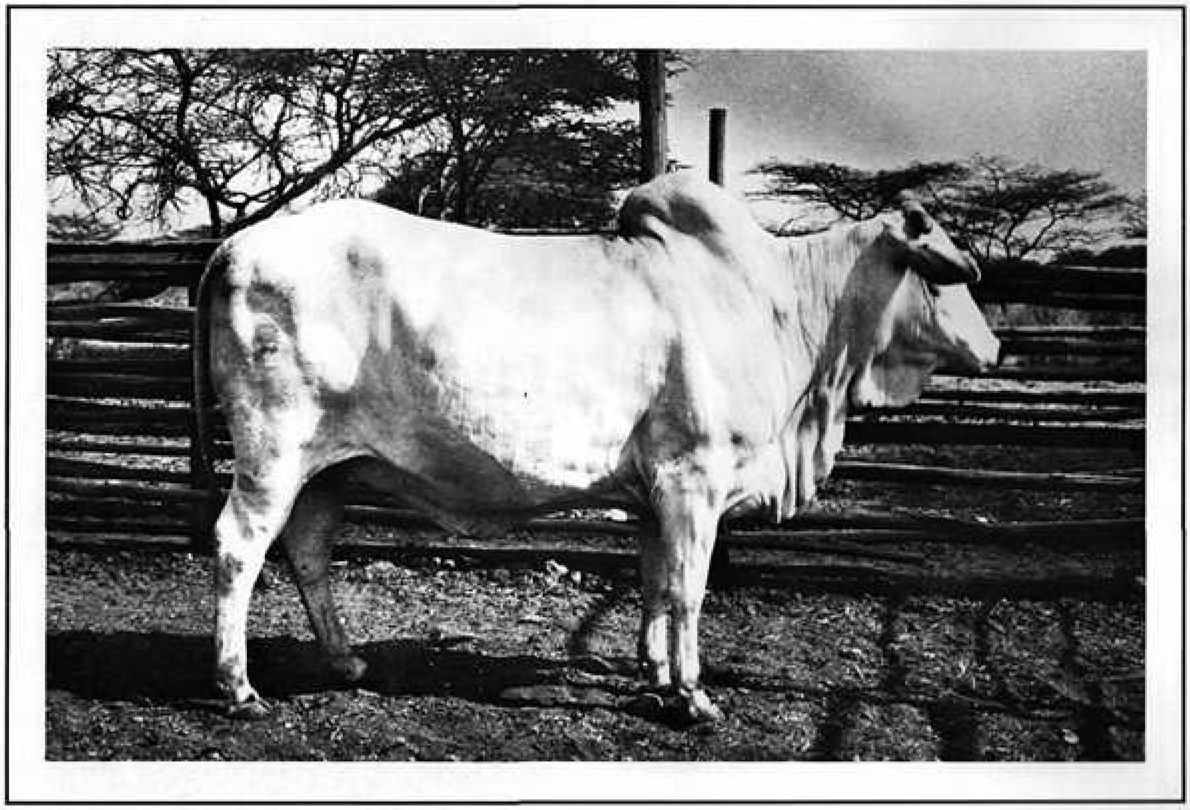
Figure 9

F

Good fat cover

A



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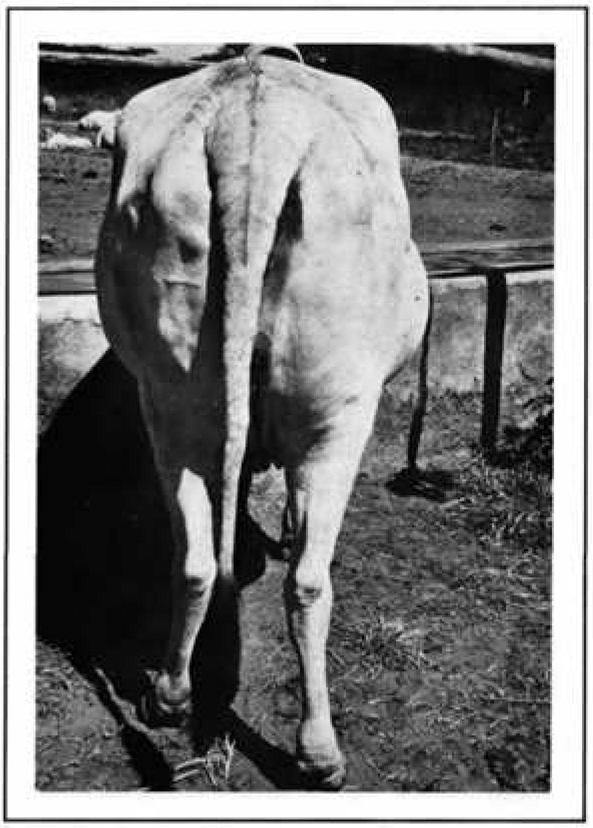

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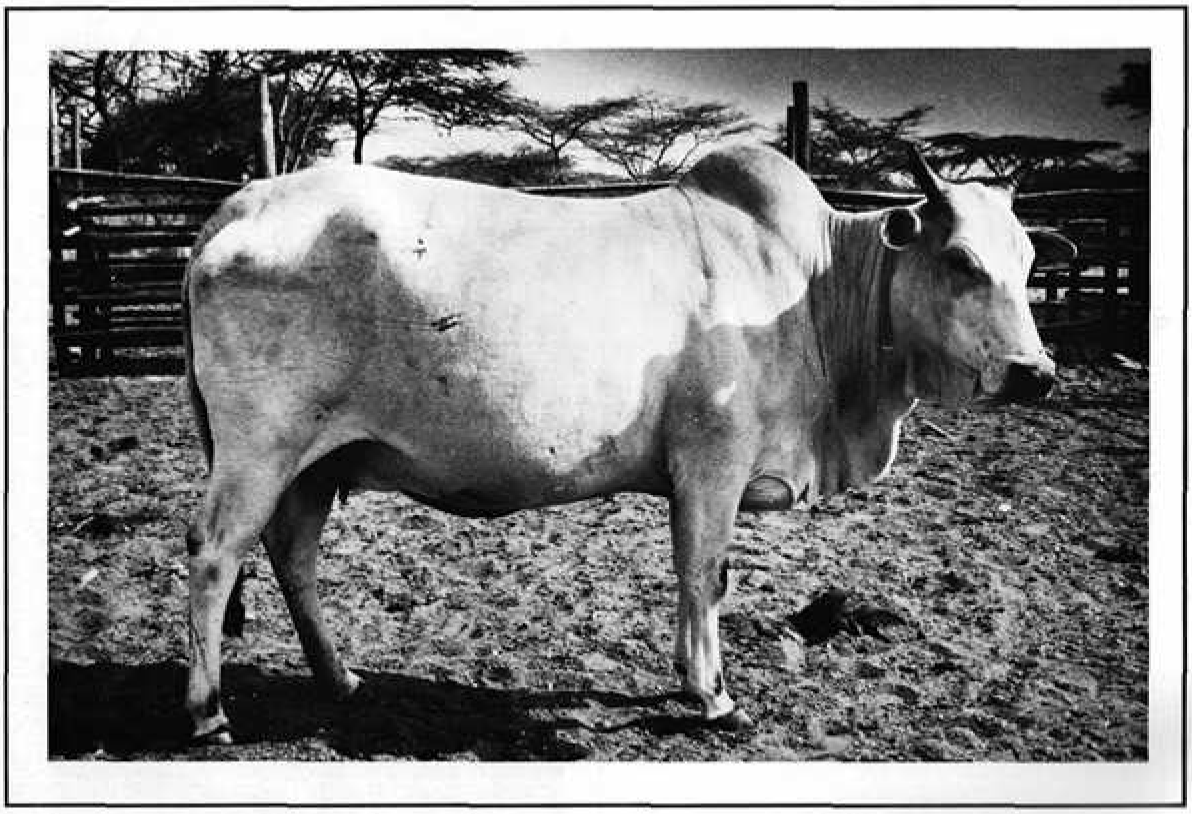
Figure 8

F-

Note the full hump;
animal is well covered with flesh and has some fat deposits

A



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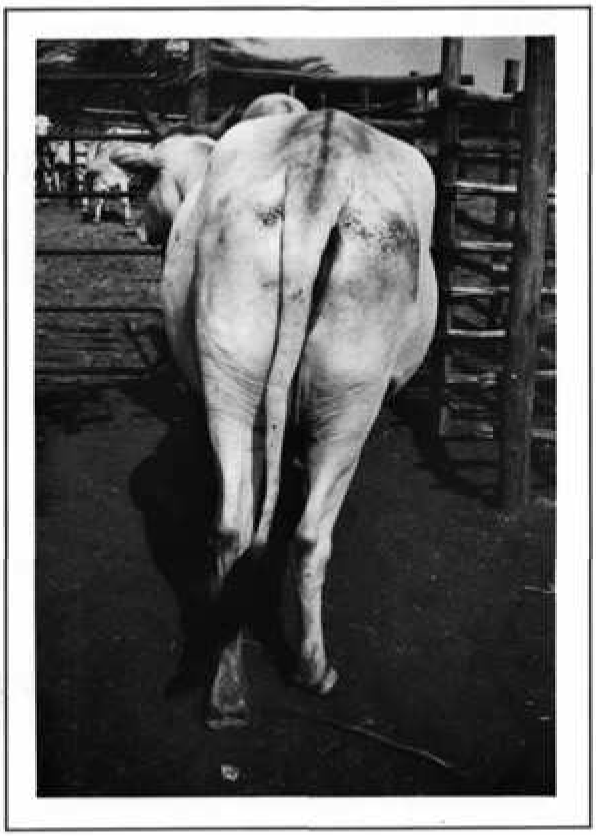

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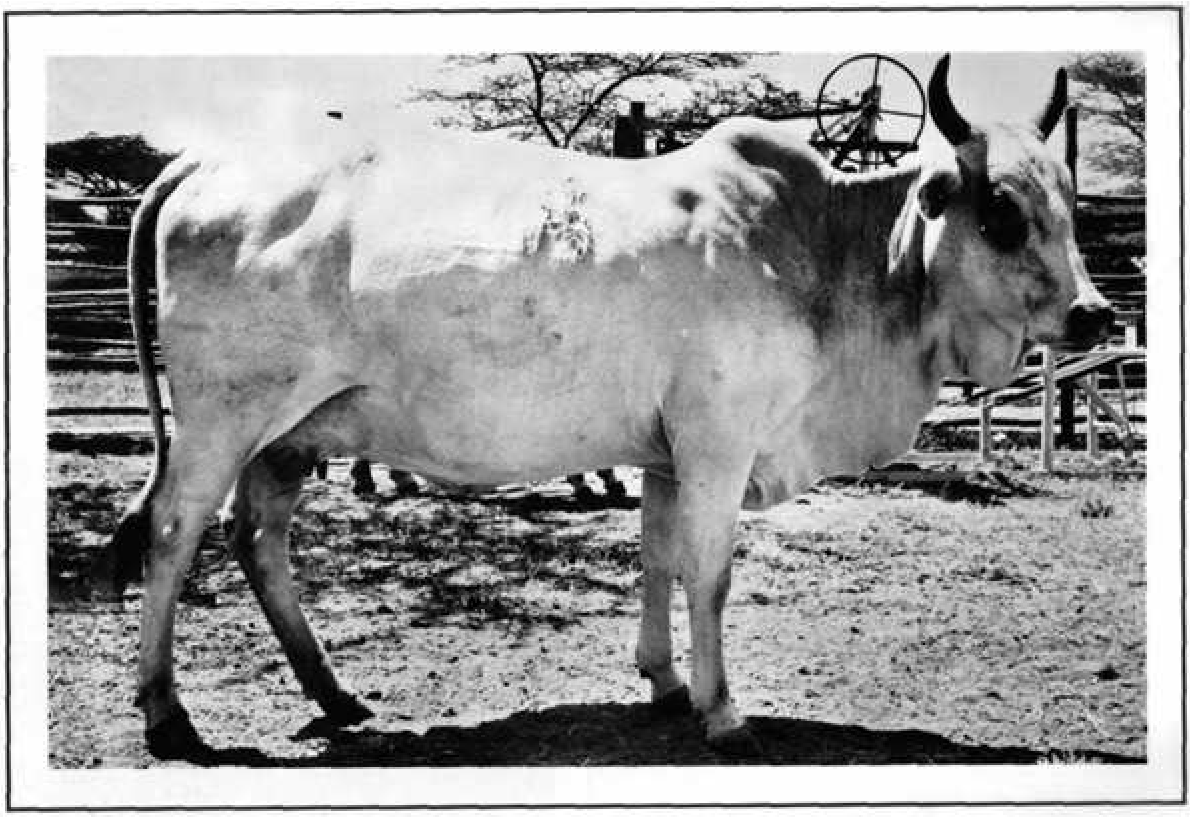
Figure 7

M+

Note the marked increase in fleshing as compared to M.
The hooks are invisible.

A



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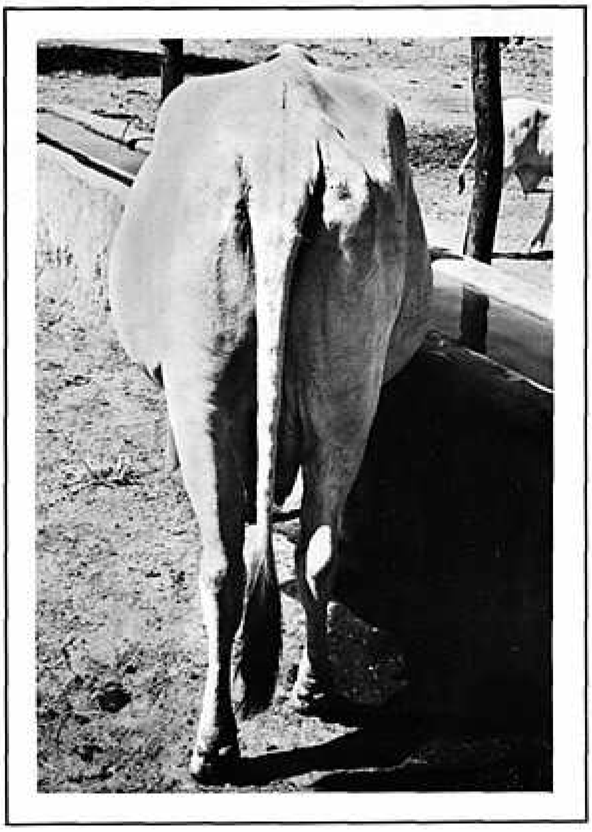

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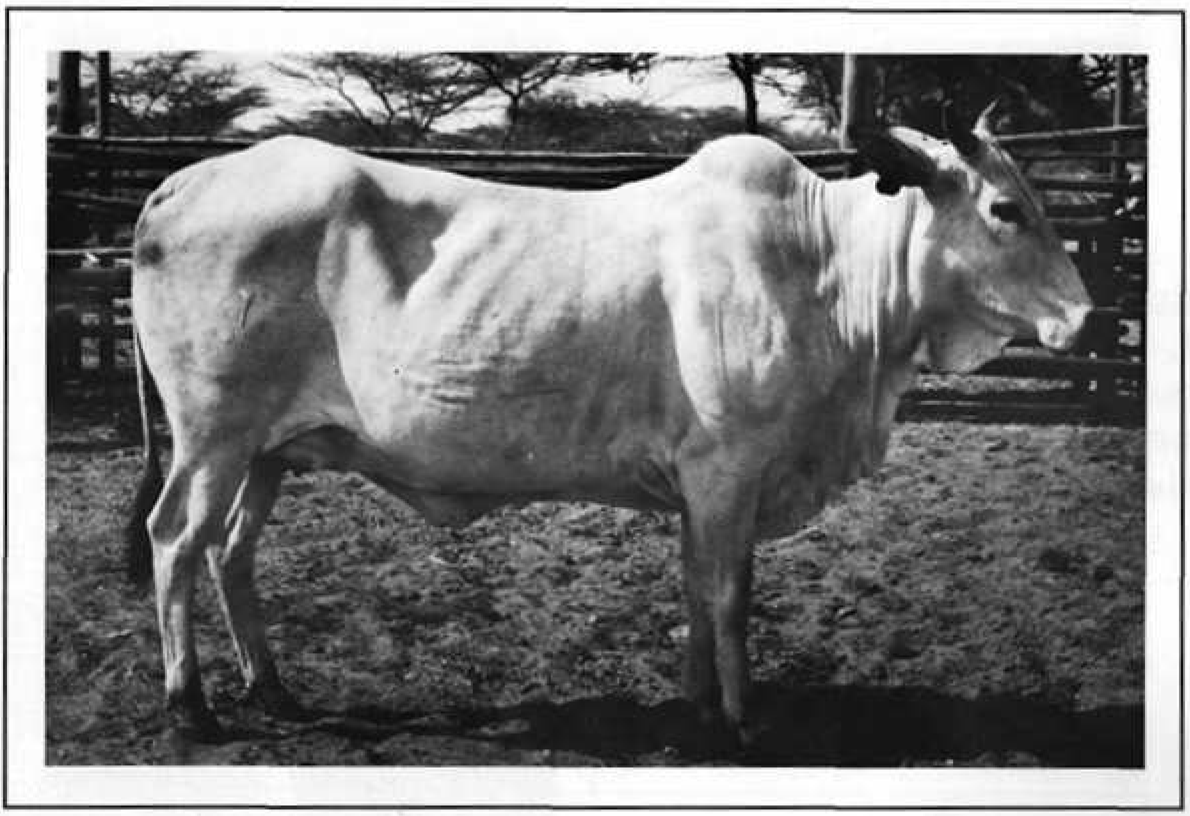
Figure 6

M

The deep sublumbar fossa is indicative of low rumen contents,
not poor condition as the animal is well fleshed

A



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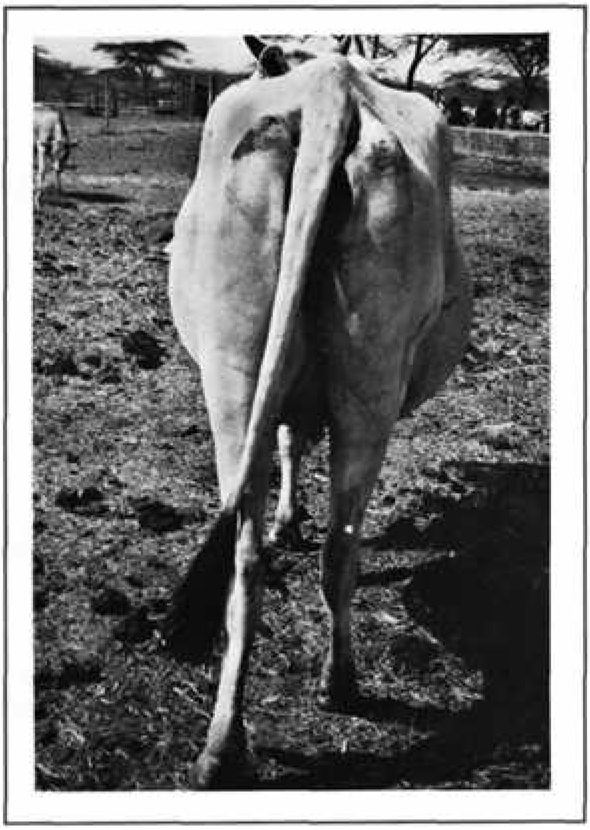

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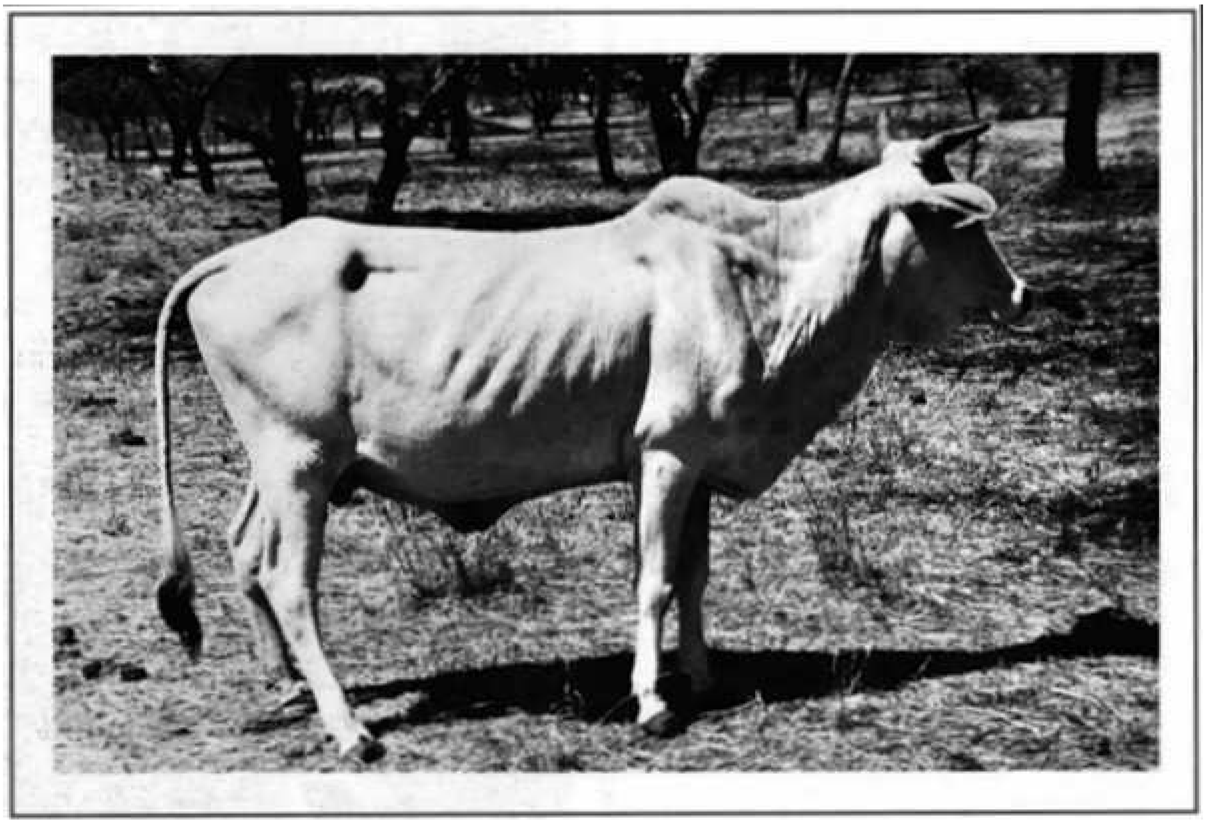
Figure 5

M-

Note that unlike in L+, the transverse processes cannot be seen individually

A



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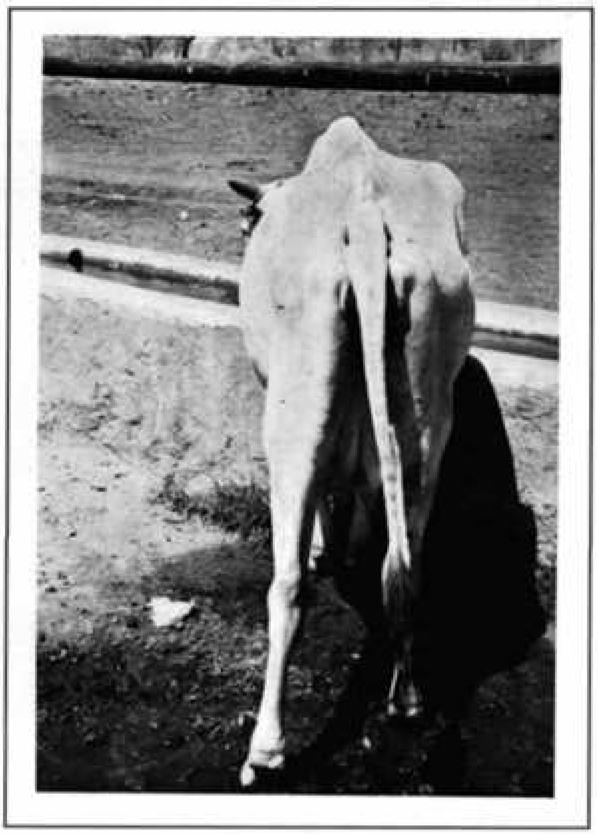

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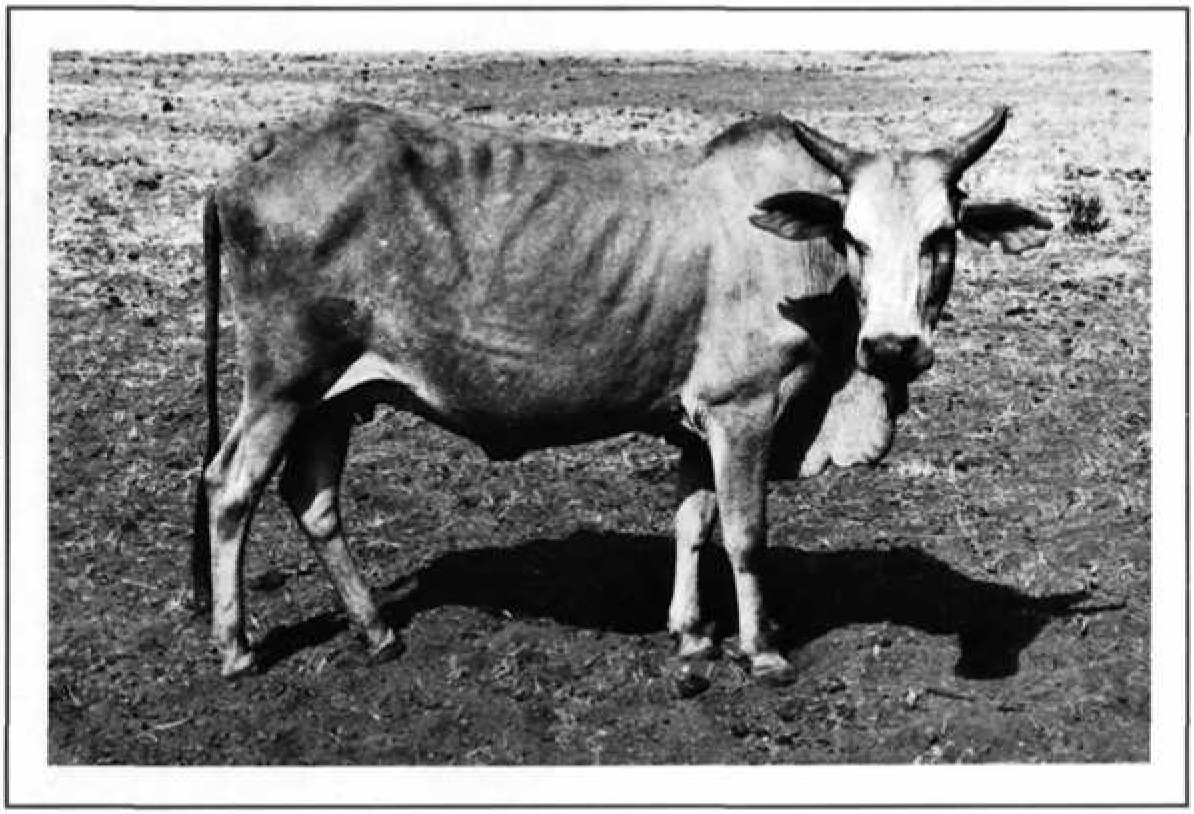
Figure 4

L+

The ribs and transverse processes are less protruding than in L.
The muscle mass between the hooks is concave

A



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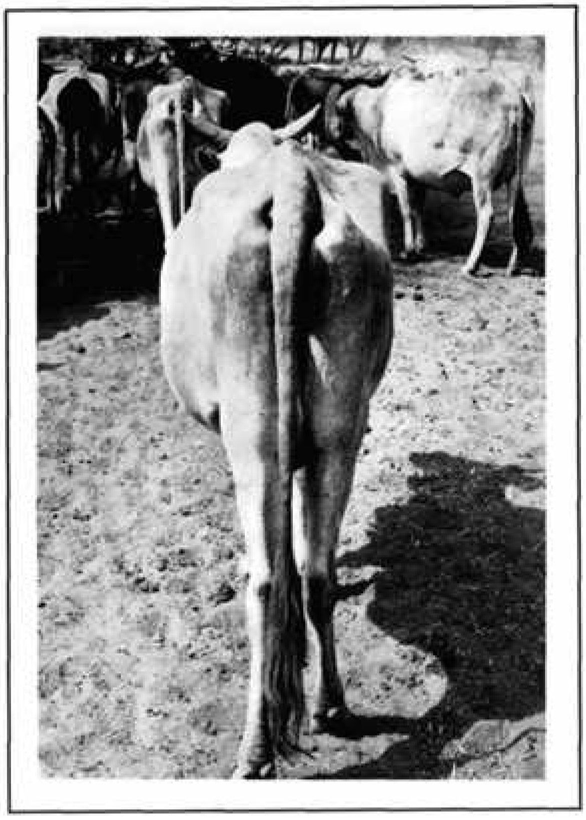

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Figure 3

L

Note the slack skin over the hump and the wasting in the leg musceles

A

B