

# Spotlight on Agriculture

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## Grazing Register: Based on the Biomass Concept

### INTRODUCTION

The grazing capacity reflects the productivity of the grazeable portion of a homogenous unit for the normal grazeable period, and aims to synchronize the requirements or intake of animals with the supply of fodder from the rangeland to the mutual benefit of both animal and plant. This implies that grazing capacity is when the vegetation is utilized to an optimum condition. The norm is set that the individual grass tuft must not be grazed down by more than fifty percent of the volume during the growing season. To be able to determine the grazing capacity of the rangeland, it is necessary for the farmer to know, what the forage production of the rangeland is, the acceptability of the different plant components to the grazing animal and the feeding requirements of the different types and classes of animal.

### CALCULATED GRAZING CAPACITY

The calculations are of results obtained from a trial to test the bio-mass concept at Uitkomst Research Station.

- Camp size = 63 ha
- Number of animals = 69
- Average animal mass = 504 kg
- Total animal mass = 34 776 kg

#### Formulas and Calculations

##### 1. Available grazeable grass yield

The available grazeable grass yield is the sum of the perennial and annual grass harvested in 40 quadrates. *Aristida* species are not harvested.

In 40 meter quadrates (40 m<sup>2</sup>) 4 993,2 gm grass was harvested.

In 10 000 m<sup>2</sup> (1 hectare) the total grazeable yield is:  $\frac{10\ 000\ m^2}{40\ m^2} \times \frac{4\ 993,3\ gm}{1\ 000\ gm} = 1\ 248,3\ kg / ha$

##### 2. Grazeable grass yield (kg grass yield / ha)

The norm set is that not more than 50 percent of the available grazeable yield is removed by the animal.

Thus: 1 248,3 kg / ha x 0,5 = **624,15 kg / ha grazeable grass**

##### 3. Calculated grazing capacity in kg live animal mass per hectare

The calculated grazing capacity is the live animal mass that can be supported through grazing per hectare per year.

Research at Omatjenne Research Station indicated that a free grazing large stock unit utilizes three percent of its live mass per day (Van Schalkwyk, 1978):

A large stock unit utilizes 3 percent of its mass per day.

Thus: 1 kg live animal mass will need 0,03 kg dry grass yield per day.

For 365 days 10,95 kg (365 x 0,03) dry grass yield will be needed.

The 10,95 kg grass yield per hectare is a constant factor which is determined by the budgeted grazing period. Should it be decided that the budgeted grazing period should be 300 days, the constant factor will be 9 kg (300 x 0,03) dry grass per hectare that will be needed.

The calculated grazing capacity will therefore be:

$$\frac{\text{Kg grazeable grass yield per hectare}}{10,95} = \frac{624,15 \text{ kg}}{10,95} = 57 \text{ kg live animal mass / ha}$$

#### 4. Grazing capacity removed during the grazing period (kg/ha)

Kilograms per hectare grazing capacity removed is that portion of the grazing capacity initially allocated to a camp which is utilized by a specific animal mass per hectare per time unit and is calculated as follows:

$$\frac{\text{Total live animal mass}}{\text{Camp size}} \times \frac{\text{Days of occupation of camp}}{\text{Budgeting period in days}} = \frac{69 \text{ Animals}}{63 \text{ ha}} \times \frac{14 \text{ Days}}{365 \text{ Days}}$$

= 21,17 kg / ha removed

#### 5. Grazing capacity available (kg / ha)

Grazing capacity available is the difference between the grazing capacity initially allocated to a camp and the grazing capacities removed during a specific grazing period.

$$57 \text{ kg / ha} - 21,17 \text{ kg / ha} = 35,83 \text{ kg / ha available for the rest of the budgeted period.}$$

#### 6. Calculation of number of animals to graze a specific camp

The number of animals to graze a specific camp is calculated as follows:

$$\frac{\text{Camp size} \times 365 \times \text{Calculate (estimated) grazing capacity}}{\text{Grazing period} \times \text{Average animal mass}}$$

#### 7. Calculation of the number of days a camp is to be grazed

$$\frac{\text{Camp size} \times 365 \times \text{Calculated (Estimated) grazing capacity}}{\text{Number of animals} \times \text{Average mass}}$$

### GRAZING REGISTER

Camp number:  Area:  Budgeting period:

#### CLIPPED GRASS PRODUCTION

a) Grazable perennial grasses:  Calculated grazing capacity:

b) Annual grasses:  Estimated grazing capacity:

Date in	Date in	Period of occupation (days)	Number of animals	Total mass in kg #	Average mass in kg #	Grazing capacity utilized in kg / ha	Grazing capacity available in kg / ha
01/06/1998	14/06/1998	14	69	34 776	504	21.17	35.83
01/08/1998	14/08/1998	14	69	34 776	504	21.17	14.66
01/10/1998	10/10/1998	10	69	34 776	504	15.12	6.51

# For these calculations animal mass was kept constant