CALIFORNIA GRAZING ACADEMY
CALCULATING THE GRAZE PERIOD

The length of the grazing period should be based on the number, size and quality of paddocks in the grazing cell. The graze period is easy to calculate. It can be determined using this formula:

$$\text{GRAZE PERIOD} = \frac{\text{RECOVERY PERIOD}}{\text{NUMBER OF PADDOCKS RESTING}} \times \text{QUALITY FACTOR}$$

The number of paddocks resting depends on the number of herds in the cell (figure 1). If one herd is in the cell or if two or more herds follow one another in the cell (leader-follower grazing) then:

PADDOCKS RESTING = NUMBER OF PADDOCKS - NUMBER OF HERDS

If two or more herds are grazing in a cell and are separated by time then:

$$\text{PADDOCKS RESTING} = \frac{\text{NUMBER OF PADDOCKS}}{\text{NUMBER OF HERDS}} - 1$$

FIGURE 1. EFFECT OF NUMBER OF HERDS ON NUMBER OF PADDOCKS RESTING

1 HERD	2 HERDS FOLLOWING	2 HERDS SEPARATED
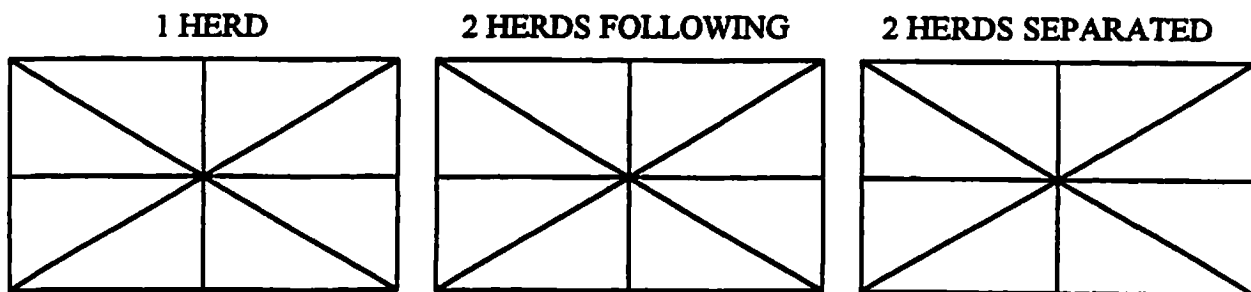
PADDOCKS RESTING:

$$8 - 1 = 7 \qquad 8 - 2 = 6 \qquad \frac{8}{2} - 1 = 3$$

The quality factor accounts for differences in size and productivity of the paddocks. It is the size or quality rating of a particular paddock divided by the average rating for all paddocks in the cell:

$$\frac{\text{PADDOCK RATING}}{\text{AVERAGE PADDOCK RATING FOR CELL}} = \text{QUALITY FACTOR}$$

For example, the quality factor for a 20 acre paddock in a cell in which the average paddock size is 40 acres, would be 0.5:

$$\frac{\text{PADDOCK SIZE 20 ACRES}}{\text{AVERAGE PADDOCK SIZE 40 ACRES}} = \text{0.5 QUALITY FACTOR}$$

If paddocks are of equal size but differ in quality, the quality factor could be the forage produced in a particular paddock divided by the average paddock forage production. A rating of quality on a scale of one to ten could also be used. A high producing paddock would rate high (8, 9 or 10). A poorer paddock would rank lower (1, 2 or 3). For example if a paddock rated 4 and the average paddock rating in the cell was 6, then the quality factor would be 0.67:

$$\frac{\text{PADDOCK RATING 4}}{\text{AVERAGE PADDOCK RATING 6}} = \text{0.67 PADDOCK QUALITY FACTOR}$$

When paddocks are of equal size and quality, the quality factor will be 1.

For example, if one group of animals is grazing in a cell which has ten pastures of equal size and similar quality and the desired recovery period is 30 days, then the graze period would be 3.3 days:

$$GP = \frac{30 \text{ Days}}{10 \text{ paddocks - 1}} \times 1 = 3.3 \text{ Days per Paddock}$$

If a cell with 10 paddocks is 800 acres (average of 80 acres per paddock) and one paddocks is 100 acres then the graze period for that paddock should be 4.2 days:

$$GP = \frac{30 \text{ days}}{10 \text{ paddocks - 1}} \times \frac{100 \text{ acres}}{80 \text{ acres}} = 4.2 \text{ days}$$

Stock days (SD) and stock days per acre (SDA) can be used to measure the days of grazing available for a particular type of animal in a paddock. (These measurements will be described in detail in chapter 6.) These measurements can also be used to calculate a quality factor.

For example, if we estimated the 100 acre paddock in our ten paddock cell yielded 25 SDA then the paddock would have 2500 SD:

25 SDA x 100 acres = 2500 SD in the paddock

If the average SD per paddock for this grazing cell were 3,000 (the sum of SD for all paddocks divided by the number of paddocks) then the graze period for paddock one would be 2.8 days.

$$GP = \frac{30 \text{ days}}{10 \text{ paddocks} - 1} \times \frac{2500 \text{ SD}}{3000 \text{ SD per paddock}} = 2.8 \text{ days}$$

When there are several paddocks of different size or quality for which grazing periods must be calculated, the arithmetic can become tedious. To simplify the math you can calculate the following constant:

$$CONSTANT = \frac{RESTING \ PERIOD}{NUMBER \ OF \ PADDOCKS \ RESTING} \times \frac{1}{AVG. \ SD \ PER \ PADDOCK}$$

By loading this value into the memory of your calculator and multiplying it by the numerator of the quality factor (the size or stock days for each paddock) you can calculate the graze periods and save some time. In this example the constant would be 0.001111:

$$0.001111 = \frac{30 \ DAYS}{10 \ PADDOCKS - 1} \times \frac{1}{3000 \ SD \ PER \ PADDOCK}$$

0.001111 X 2500 STOCK DAYS = 2.8 DAYS GP