

HOW MANY COWS CAN MY PROPERTY SUPPORT?

BASICS OF CARRYING CAPACITY, STOCKING RATE, AND PASTURE IRRIGATION

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INTRODUCTION

A critical component of grazing livestock sustainably is understanding the concept of carrying capacity; that is, the amount of forage an acre of pasture or rangeland will produce. Our goal is to match carrying capacity (supply) with the number of livestock to be grazed over a given time period (stocking rate, or demand). This brief fact sheet will help livestock producers determine how many animals can be sustained based on available land and irrigation resources.

ESTIMATING CARRYING CAPACITY:

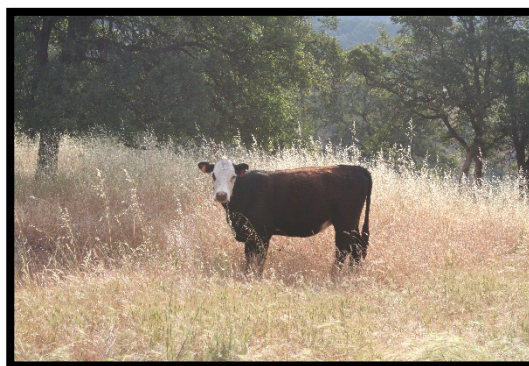
Experienced livestock managers can estimate carrying capacity through visual observation, clipping and weighing vegetation, or past experience. As a rule of thumb, we need 15-18 acres of unirrigated annual rangelands in the Sierra Foothills to support one average sized cow (1,200 lbs) for a year. On irrigated pasture, we'll typically produce enough forage to support this cow on one acre for a 6-month grazing season. Well managed grazing can increase the harvest efficiency of livestock, which in turn increases the carrying capacity of our rangeland and pastures by as much as 30 percent.

STOCKING RATE:

A number of factors influence the daily forage intake of grazing livestock, including animal species, weight, forage quality, and animal stage of production (e.g., gestation, lactation, etc.). On high quality forage (e.g., spring grass or irrigated pasture), a lactating cow will consume about 2.3% to 2.5% of her body weight each day on a dry matter basis. A non-lactating cow will consume 2.0% to 2.1% of her body weight.

We can standardize the amount of forage demanded by calculating an animal unit month (the amount of forage that a 1200 lb cow without a calf would consume in one month (about 780 pounds of air dried forage). Our forage demand can be adjusted based on livestock type and production stage as follows:

CATTLE	Mature cow (1200 lb.) without calf	1.0 AU
	Cow with calf	1.2 AU
	Weaned calf to yearling	0.6AU
	Steers/Heifers (1-2 years)	1.0 AU
	Mature Bulls	1.3 AU
SHEEP	5 Mature ewes with or without lamb	1.0 AU
	5 Weaned Lambs to yearlings	0.6 AU
	5 Mature Rams	1.3 AU
GOATS	6 Does with or without kids	1.0 AU
	6 Weaned Kids to yearlings	0.6 AU
	6 Mature Bucks	1.3 AU
HORSES	Mature Horse or Mule	1-1.25 AU



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EXAMPLE: CALCULATING A FORAGE BUDGET

- How many acres of annual rangeland and irrigated pasture will we need for 50 cows?

Assumptions:

- Cows will graze on annual rangeland from October 15 through April 15
- Cows will graze on irrigated pasture from April 15 through October 15
- We don't want to feed any hay!
- Annual rangeland acreage = 50 cows x 15 ac/cow/yr. x ½ year = 375 ac
- Irrigated pasture acreage = 50 cows x 1 ac/cow/6 mo. = 50 ac

IRRIGATED PASTURE:

Irrigation water demand is driven by evapotranspiration rates (ETo). ETo refers to the amount of water lost through evaporation or through plant transpiration. The graph below generally depicts typical ETo in the Sierra Foothill Region. Obviously, actual ETo depends on real-time climate and weather factors (including air temperature, wind, and humidity). Effective irrigation replaces the water lost to ETo. Note that in June and July, a pasture in Auburn would need the equivalent of 8 inches of rainfall (through irrigation) to meet soil and plant demand.

Many of our foothill irrigation districts measure water by the miner's inch (a relic of our region's gold mining past). Locally, one miner's inch of irrigation water equals 11.22 gallons per minute. To ensure adequate irrigation during the hottest summer months of July and August, we need one miner's inch per 1.67 to 2 acres of irrigated pasture.

