

Determining stocking rate and acreage needed

How many animals should be put in a pasture?

The answer to this question about stocking rates depends on your goals. If you have a limited amount of pasture land but a flexible herd size, you'll probably benefit from going to a more intensive system. If you don't plan on feeding supplement and/or are more concerned about individual animal gain than gain per acre, you may wish to stock at a lower level.

The calculations below will give a rough estimate of the maximum number of animals that can be grazed on your land.

- 1) Determine total pasture acreage for the season (example: 20 acres).
- 2) Estimate average pasture yield per acre. For average yields of various forage mixtures see tables 2 or 3 or use your own figures if you have them (example: 4000 lb/acre).
- 3) Estimate the length of your grazing season in days (example: May 15 through October 15 or 153 days).
- 4) Estimate the average weight of one of your animals for the season

$$\text{Average weight} = \frac{(\text{beginning weight} + \text{predicted final weight})}{2}$$

Some average weights:

dairy cow (Holstein) = 1300 lb	horse = 1250 lb
beef cow = 1000 lb	goat = 170 lb
beef bull = 1250 lb	ewe and lamb = 200 lb

- 5) Estimate the maximum animal numbers that can be grazed on your pastures during an entire season:

$$\text{Number of animals} = \frac{(\text{total acreage}) \times (\text{average yield/acre})}{0.04^* \times (\text{average weight/animal}) \times (\text{total days grazed})}$$

For example, for a ewe and a lamb:

$$\text{Number of animals} = \frac{20 \text{ acres} \times 4000 \text{ lb/acre}}{0.04 \times 200 \text{ lb} \times 153 \text{ days}} = 65 \text{ ewes with lambs}$$

How many acres do my animals need?

If you have a lot of pasture and a fixed number of livestock, you might want to use a less-intensive system to maximize production per head rather than per acre. The calculations below will tell you the minimum amount of land required to pasture your herd. Remember, you can always use more than the minimum.

The minimum amount of land needed to pasture your herd:

$$\text{Pasture acreage needed} = \frac{(\text{number of animals}) \times (\text{average weight/animal}) \times 0.04^* \times (\text{total days grazed})}{(\text{average yield/acre})}$$

For example, if you have 25 Holstein cows:

$$\text{Pasture acreage needed} = \frac{25 \text{ cows} \times 1300 \text{ lb/cow} \times 0.04 \times 153 \text{ days}}{4000 \text{ lb/acre}} = 49 \text{ acres}$$

**The 0.04 figure is used because livestock need to have daily access to approximately 4% of their live weight in forage (2.5% intake, 0.5% trampling loss, and 1% buffer). This figure may be decreased if you are willing to feed supplemental hay or grain during periods of low production.*

These calculations should be used only as guides to help you get started. Actual numbers will vary from site to site and from year to year because of variations in the weather, soil type, and pasture condition.

Table 2. Average forage yields for southern Midwest region

Species	Quality ^a	Yield (lb/a DM)	% Available by month					
			May	June	July	Aug.	Sept.	Oct.
Cool-season perennial grasses								
Kentucky bluegrass	Good	5680	30	30	10	10	15	5
	Poor	1900	10	40	10	15	15	10
Orchardgrass	Good	6440	20	35	15	10	15	5
	Poor	2260	10	30	10	20	20	10
Reed canarygrass	Good	6180	20	30	25	10	10	5
	Poor	2720	20	30	20	10	15	5
Smooth bromegrass	Good	6080	30	30	15	10	10	5
	Poor	2620	25	35	10	10	15	5
Tall fescue	Good	7940	20	30	20	10	15	5
	Poor	2740	15	40	10	10	15	10
Timothy	Good	6260	25	35	10	10	15	5
	Poor	2340	10	45	10	15	15	5
Warm-season grasses								
Big bluestem	Good	5000	0	10	40	35	15	0
	Poor	2520	0	15	40	35	10	0
Switchgrass	Good	5000	0	15	35	35	15	0
	Poor	2500	0	15	45	35	5	0
Sorghum/Sudangrass	Good	5500	0	0	20	30	30	20
	Poor	3000	0	0	40	45	15	0
Legumes								
Alfalfa/grass	Good	5820	20	25	35	20	0	0
	Poor	3000	20	25	35	20	0	0
Birdsfoot trefoil	Good	5120	10	50	30	10	0	0
	Poor	2500	10	50	30	10	0	0
Red clover/grass	Good	5500	25	40	20	10	5	0
	Poor	2750	25	40	20	10	5	0
Alternative forages (cool-season annual grasses)								
Oat	Good	3000	55	35	10	0	0	0
	Poor	1600	60	40	0	0	0	0
Winter rye	Good	2800	55	25	0	0	5	15
	Poor	1200	65	25	0	0	5	5
Winter wheat	Good	2800	55	25	0	0	5	15
	Poor	1200	60	30	0	0	5	5

^a**Quality:** Good = Lime and fertilizer have been applied. Rotational grazing.
 Poor = No fertilizer added. Continuous grazing.



Table 3. Average forage yields for northern Midwest region

Species	Quality ^a	Yield (lb/a DM)	% Available by month					
			May	June	July	Aug.	Sept.	Oct.
Cool-season perennial grasses								
Kentucky bluegrass	Good	4700	30	20	20	10	15	5
	Poor	1240	15	45	15	10	10	5
Orchardgrass	Good	5580	25	20	20	15	15	5
	Poor	1520	20	35	20	10	10	5
Reed canarygrass	Good	5460	25	20	30	10	10	5
	Poor	1940	25	30	20	10	10	5
Smooth bromegrass	Good	4900	35	20	20	10	10	5
	Poor	1780	30	30	15	10	10	5
Tall fescue	Good	6000	15	25	20	15	15	10
	Poor	1740	20	45	15	5	10	5
Timothy	Good	4800	25	30	15	10	15	5
	Poor	1600	15	50	10	10	10	5
Warm-season grasses								
Big bluestem	Good	3500	0	0	25	50	25	0
	Poor	2520	0	0	30	45	25	0
Switchgrass	Good	4830	0	0	35	50	15	0
	Poor	2170	0	0	30	45	25	0
Sorghum/Sudangrass	Good	5500	0	0	20	30	30	20
	Poor	3000	0	0	40	45	15	0
Legumes								
Alfalfa/grass	Good	5540	20	30	30	20	0	0
	Poor	3000	20	30	30	20	0	0
Birdsfoot trefoil	Good	4320	10	40	35	15	0	0
	Poor	2500	10	40	35	15	0	0
Red clover/grass	Good	5500	20	30	30	20	0	0
	Poor	2750	20	30	30	20	0	0
Alternative forages (cool-season annual grasses)								
Oat	Good	2500	55	35	10	0	0	0
	Poor	1600	60	40	0	0	0	0
Oat + rape	Good	2410	30	45	25	0	0	0
	Poor	1600	30	45	25	0	0	0
Winter rye	Good	2300	55	25	0	0	5	15
	Poor	1200	65	25	0	0	5	5

^a**Quality:** Good = Lime and fertilizer have been applied. Rotational grazing.
 Poor = No fertilizer added. Continuous grazing.



Pastures for profit: A guide to rotational grazing

Source:

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