

Length of the Average Grazing Season Month

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When designing grazing management strategies, range managers need to know the number of days in the average grazing season month in order to calculate the number of cow-calf pairs to turn out onto a pasture. The calculation is based on the size of the pasture in acres (AC), the evaluated stocking rate potential (acres (AC)/animal unit month (AUM)), and the number of days in the grazing season (converted to months (M)):

$$\begin{aligned} & \text{Total number of pasture acres (AC)} \div \\ & \text{evaluated stocking rate (AC/AUM)} \div \text{length} \\ & \text{of grazing season in months (M)} \\ & = \text{number of cow-calf pairs (AU)} \end{aligned}$$

An animal unit (AU) is the equivalent of one mature cow of about 1000 pounds, with or without a calf. An animal unit month (AUM) is the amount of forage dry matter required by one animal unit (AU) for 1 month (M). The length of the grazing season in months is calculated by dividing the number of days in the grazing season by the number of days in the average grazing season month. How many days are in the average grazing season month? This seemingly superficial question does not have a simple answer, and because of its importance to range managers, this question should be given careful consideration. Currently, three values for the length of an average grazing season month are used relatively indiscriminately: 30 days, 30.5 days, and 31 days.

The results of calculations of the number of cow-calf pairs to be turned onto a pasture are greatly affected by the value used for the length of an average month. For example, the solution to the equation determining the number of cow-calf pairs to be supported on a pasture that covers 3840 acres, has a potential stocking rate of 3.0AC/AUM, and is to be grazed seasonlong for 183 days, from 16 May to 15 November, would vary according to different average month lengths used. The calculations would indicate that the number of cow-calf pairs to be turned out onto this pasture would be 210 pairs if 30 days per month ($183d \div 30d = 6.1M$) were used, 213 pairs if 30.5 days per month ($183d \div 30.5d = 6.0M$) were used, and 217 pairs if 31 days per month ($183d \div 31d = 5.9M$) were used.

This paper will attempt to present justifications for the acceptance of one value for the length of an average grazing season month and for its uniform use in calculations applied to grazinglands in the Northern Plains.

The earth completes 1 rotation on its axis in a period of time called a day. The earth revolves around the sun in a period of time called a year. One year is equal to 365.2425 days. The additional quarter of a day is corrected by adding 1 day every 4th year. In the Gregorian calendar, each year comprises 12 months: 7 with 31 days, 4 with 30 days, and 1 with 28 days for 3 years and 29 days every 4th year. There are 1461 days in a cycle of 48 months. The average month in this 4-year cycle contains 30.44 days. This would be an accurate value to use in calculating stocking rates of grazing systems in areas that graze 12 months per year.

The climate in the Northern Plains does not permit grazing for 12 months, however. In the calculation of the average length of a grazing season month, a logical practice would be to eliminate from the data set the months during which grazing does not occur. Debate exists over the period to be considered grazing season months in the Northern Plains, and the determination depends on specific situations, including available forage types and management strategy applied. The length of the average grazing season month could range from 30.3 days to 30.7 days, depending on which months were selected. The probability of occurrences of inclement weather conditions is high in December, January, February, and March; these months are also characterized by average monthly temperatures too low to support plant growth. Grazing during this 4-month period would not be dependable. The active growing season for perennial plants is from about mid April to mid October. The 8-month period of April through November has the potential to have some livestock grazing, although grazing during this time is not recommended as a universal practice. This period has 244 days and an average month length of 30.5 days.

The results of the practical application of the average month length in a 4-year cycle and of the average month length in the 8-month grazing season in the Northern Plains are the same. In the example presented earlier, if 30.44 days were the value used for the average month length, the calculation would indicate that 213 cow-calf pairs should be turned onto the pasture ($3840\text{AC} \div 3.0\text{AC/AUM} \div 6.01\text{M} = 212.91 \text{ AU}$). Likewise, if the value used for the average month length were 30.5 days, the calculation would indicate that 213 cow-calf pairs should be turned onto the pasture ($3840\text{AC} \div 3.0\text{AC/AUM} \div 6.0\text{M} = 213.33 \text{ AU}$). This paper demonstrates that in calculations of stocking rates for grazing management strategies in the Northern Plains, 30.5 days more accurately reflects the length of the average grazing season month than 30 or 31 days.

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