

Vitamin A Requirements and Considerations for Beef Cattle

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Vitamin A is a fat-soluble vitamin that is important for reproduction and several metabolic functions. Requirements for vitamin A are generally met from green growing forages. However, during extended periods with no green grass it is important to provide supplemental vitamin A to cattle.

A vitamin A deficiency can result in reduced feed intake, low conception rates, abortions, stillbirths, abnormal semen production, and blindness. The vitamin A requirement for cattle is approximately 27.2 international units (IU) per pound of body weight for dry pregnant heifers or cows and 38.1 IU per pound of body weight for lactating cows (NRC, 2016). Table 1 shows the requirements for cows ranging in weight from 1,000 to 1,600 pounds.

When supplies of vitamin A exceed requirements cattle can store excess vitamin A in the liver for later use. However, from a practical standpoint these stores are not likely to provide more than a 2 to 4 month supply.

If green grass is lacking for more than 45 – 60 days, it is important to provide supplemental vitamin A. This can be accomplished by feeding mineral supplements or feeds with high levels of vitamin A. Table 2 shows how much vitamin A can be provided from mineral supplements varying in vitamin A content. As shown in the table, if a mineral supplement contained 200,000 IU of vitamin A per pound and consumption was 0.25 pounds per day it would provide 50,000 IU of vitamin per day. This would be enough to meet the daily needs of a 1,300 pound dry or lactating cow.

Vitamin A can also be supplied through injectable products. Many of these products also contain vitamins D and E. Vitamin A concentration and dosages will vary, but at the highest labeled dose rate will result in providing either 1,000,000 or 2,000,000 IU of vitamin A per injection (Table 3). The products that supply 2,000,000 IU would provide about a 56 day supply of vitamin A for a 1,300 pound dry cow or 40 days if she is lactating.

Table 1. Daily vitamin A requirement for beef cows and heifers

Cow weight, lb	Dry pregnant cows or heifers, IU	Lactating Cows, IU
1,000	27,200	38,100
1,100	29,920	41,910
1,200	32,640	45,720
1,300	35,360	49,530
1,400	38,080	53,340
1,500	40,800	57,150
1,600	43,520	60,960

Table 2. The effect of vitamin A concentration in the mineral on vitamin A consumption

IU of vitamin A per lb of mineral supplement	Daily intake of mineral supplement, lb	IU of vitamin A consumed per cow each day
100,000	0.25	25,000
150,000	0.25	37,500
200,000	0.25	50,000
300,000	0.25	75,000

Table 3. The effect of vitamin A concentration in injectable products on the length of time the injection can meet the vitamin A requirements of a 1,300 pound cow

IU of vitamin A per mL	Dose rate per cow, mL*	IU of vitamin A supplied per injection	1,300 lb dry pregnant cow, days supplied per injection	1,300 lb lactating cow, days supplied per injection
100,000	10	1,000,000	28.3	20.2
200,000	10	2,000,000	56.6	40.4
500,000	4	2,000,000	56.6	40.4

*Labeled dose rates are based on the age of the animal and not the weight.

Literature Cited

NRC. 2016. Nutrient Requirements of Beef Cattle. 8th rev. ed. The National Academies Press, Washington, DC.