Toxicity.—Although sorghum and its varieties are widely grown as feed crops, they become toxic under the conditions described below. They belong to a group known as cyanogenetic plants. Such plants contain a glucoside from which prussic acid or hydrocyanic acid is liberated. Hydrocyanic acid is one of the most potent poisons known. The acid must be liberated from the glucosidal combination before poisoning can result. Enzymes which are present in the plant tissues free the hydrocyanic acid from the remainder of the glucoside. The acid is absorbed and carried by the blood stream to the body tissues where the action of the oxidative enzymes is inhibited. The tissues fail to receive oxygen. The process is one of internal asphyxiation.

A number of factors affect the amount of cyanogenetic glucoside found in the plant. The application of nitrogenous fertilizers has been known to increase it 20 times, particularly on poorer soils. The amount of glucoside in the plant decreases as it matures. Differences in cultural practices and climatic conditions cause variation in glucosidal content. Second growth and plants stunted by drouth or other unfavorable conditions are particularly dangerous.

Much of the hydrocyanic acid is set free when the cut plant is dried slowly. Sorghum raised under drouth conditions is partially dry when cut, dries quickly, and therefore is potentially dangerous and should be fed with caution.

Cyanogenetic plants killed by frost often are dangerous for a number of days. While this may appear to be true in some instances, probably more important are the conditions under which the plant is fed, as well as physical conditions in the stomach of the animal to which it is fed.

Symptoms.—Lethal amounts of hydrocyanic acid cause death almost instantaneously, with spasms and respiratory paralysis. Smaller doses cause a short period of initial stimulation, associated with excitement and convulsions. Depression then occurs. Respirations become deeper and accelerated, later to become weak and irregular before finally ceasing. The pupils are dilated. The eyes are prominent, glassy, staring and nonsensitive to light. The nostrils and mouth usually are filled with foam. Involuntary urination and defecation often occur.

Prevention.—The feeding of concentrates tends to prevent in the rumen the liberation of hydrocyanic acid from sorghum which may be eaten within approximately 24 hours thereafter. Large amounts of dextrose also tend to reduce harmful results.