

chlorophyll is changed into several compounds, one of which is a porphyrin called phylloerythrin (6, 10). Normally this phylloerythrin is removed from the circulatory system by the liver and excreted in bile through the bile duct into the small intestine. From this point it is excreted with the feces.

When this normal method of excretion is inhibited, the excess phylloerythrin in the blood becomes a photosensitizing agent and causes the thin-skinned and non-pigmented skin areas to become sensitive to the sunlight. Under these conditions phylloerythrin is excreted in the urine, causing it to appear a dark reddish-brown color, which at first sight might suggest hematuria or bloody urine (6, 10).

The metabolic changes which inhibit this normal excretion of phylloerythrin are still a mystery to some extent. When phylloerythrin is extracted artificially and injected into the circulatory system experimentally, the animal becomes photosensitized without icterus. When the bile duct is ligated experimentally in a normal animal, the phylloerythrin is taken up by the blood stream, producing photosensitization, with icterus. These facts indicate that icterus is the cause of the photosensitization since icterus was not a result of the presence of phylloerythrin in the circulation (1).

Numerous workers in New Zealand have accepted this theory and some investigators are studying the facial eczema situation under the terminology of "hepatogenous photosensitivity" (2). Others have found that guinea pigs are satisfactory experimental animals for determining if a forage is toxic and then preserving hay from these toxic pastures for later studies with sheep (17). Another important step in these studies was the development of a chemical test, "beaker test", for determining forage toxicity and its capacity to produce facial eczema when fed to lambs (14, 16, 18). Histological studies of the livers of sheep affected with facial eczema showed that a cholangitis (inflammation of the bile ducts) developed in which the ducts became occluded with a fibrous growth or connective tissue. Cirrhosis and icterus develop from this retention of bile, and photosensitization follows if the animal is on pasture or a ration of green feed (12).

SYMPTOMS

The earliest noticeable symptoms of photosensitization in cattle are an empty, dejected appearance combined with excessive salivation, sometimes lacrimation and usually diarrhea (Fig. 1).