Barley and oats grown in the United States are used chiefly for the feeding of livestock. The evaluation of these grains, therefore, is a matter of interest to stockmen, farmers, and agronomists generally. The federal grades for oats and barley (1) are used to indicate the quality of such grain as it enters into commerce. During recent years the question has been raised as to how accurately quality is reflected in the official grades. The grades are determined by an examination of physical factors, and the use of physical factors alone in the determination of quality undoubtedly has certain limitations.

When oats and barley enter into a ration for livestock, standard analyses (6) are generally used to provide the proper nutritive ratio, but even here there is some question as to the accuracy of this practice. Is it not reasonable to suppose that varieties and types of grain will differ in composition even when grown under comparable conditions? Certainly this is true of wheat (5), and we have ample evidence that the composition of wheat is influenced to a marked degree by variation in the growth conditions (3, 9).

Dairymen in western Oregon reported difficulty in computing satisfactory rations when standard analyses (6) were used. This suggested the studies reported herein. Although the results obtained are not conclusive, they do suggest that some revision of our practices may be desirable. They suggest also that such variations as are found in these studies may well exist in other sections.

MATERIAL AND METHODS

Varieties of oats and barley grown in the field varietal trials at the Oregon Experiment Station were selected for analysis. The varieties selected were grown in two different years (1929, 1930) and on three different soil types, namely, Chehalis, a fine sandy loam...