VARIATIONS IN SPECIFIC GRAVITY OF POTATOES

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Many factors such as rainfall, temperature, sunlight, soil type, fertilizers, irrigation, and more recently the use of fungicides, insecticides and vine killers have been listed as influencing the specific gravity of potatoes (2, 5, 6). That different varieties and kinds of potatoes vary in specific

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gravity and hence in food value has been recognized for over 100 years (7).

The relation between specific gravity and certain cooking quality factors, such as mealiness, has been noted by a number of investigators. The existence of considerable variation in specific gravity of the individual tubers in small lots of potatoes has aroused interest in the possibility of commercial separation of potatoes into lots of different specific gravities. Potato breeders (1) consider specific gravity a definite genetic characteristic although considerable differences are found among tubers of the same variety in the same field. The purpose of this paper is to report the variations in specific gravity that occurred among the tubers in several varieties from different growing areas over a period of several years and to note the influence of some storage conditions on the specific gravity of the potatoes.

**MATERIALS AND METHODS**

Five varieties each from three locations and one variety (Triumph) from two locations were used. The lots were obtained from commercial production areas in ten different states but were not necessarily from the same farms or fields in the different years. All were graded U. S. No. 1 Size A unwashed late crop potatoes. Specific gravity was determined by immersion of the individual tubers in salt solutions of different concentrations as described by Clark *et al.* (3). Fifty-tuber samples were used from the freshly harvested lots and various other samples were taken after 2 to 4 months' storage (midseason storage), at 40°F and 55°F. Other samples were taken after 5 to 6½ months' storage (late season storage), at 40°F. Temperatures in the storage rooms were thermostatically controlled, but the humidities were regulated largely by manual devices. Attempts were made to maintain relative humidities of 85 to 90 per cent, but there was some variation.

**DISCUSSION OF RESULTS**

*Standard Deviations of Specific Gravity.*

The total number of tubers tested, the average specific gravity for each lot computed from the values for all the individual tubers and 2 times the standard deviations are given in table 1 for each variety at its specific location for each year. The average specific gravity differs from year to year for the lots obtained from the same general location. The deviations indicate that these same lots were much more variable in some years than in others. The weighted average deviations for location show that potatoes tend to be more variable in specific gravity in some locations. For example, in the data for the Katahdin variety, high deviations are shown in the sample from Colorado. The Irish Cobbler and Chippewa varieties were more uniform in specific gravity than the other varieties. This indicates that commercial separation on the basis of specific gravity