Chapter 12

Breeding for Improved Nutritional Quality of Crops

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The ancient Biblical writer was well aware of his environment and his needs when he wrote, "All flesh is grass" (Isaiah 40:6). People have always been directly dependent upon the growing plant as food for consumption and feed for animals. Even before people cultivated plants, they gathered plants selectively to meet their needs.

For thousands of years the only tools available to measure the quality of food were trial, error, and observation. Nevertheless, tremendous progress was made in selecting high quality food. Most of the crops cultivated today remain nearly the same, in terms of nutritional quality, as those selected many centuries ago.

In the last two decades increasing world population pressures have focused attention on the nutritional inadequacy of the diets of millions of people. Special concerns exist when nearly all of the daily food intake comes principally from plant sources. When social conditions prevail that restrict diets to one or a few food sources, such diets invariably consist of low cost products, usually a cereal grain or a root crop. While these are not in themselves inferior food sources, when consumed alone they may fail to provide either the quantity or quality of some of the essential dietary components.

Quality means different things to different people. The descriptive terms used to define quality vary from those used at the time of food production until it is finally consumed. Common terms are used to denote appearance, storage quality, processing quality and, in a few cases, nutritional worth.

Nearly all of the investigations of quality in our crops have been upon those factors related to processing quality—milling and baking of wheat, canning of beans, chipping of potatoes, malting of barley, and fermenting of grapes. All of these processes are highly specialized. Special laboratories have been built by federal and state governments and private industry to provide technical support to plant breeders in their quest to improve the quality of crops.