

Crops as Sources of Nutrients for Human

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Foreword

Because most agronomic research has focused on increased crop yields, the effects of genetic and management variables on plant composition have often been overlooked. Humans, especially those in developing countries, are dependent upon plant products not only for carbohydrate and protein, but also for vitamins, minerals, and essential fatty and amino acids that are critical to a balanced diet and health. Some plant species contain antimetabolic factors, and the bioavailability and usefulness of mineral nutrients in plant products are much affected by plant genotype and mineral availability from the soil. Thus, agronomy, via its various research disciplines, must provide plant products that, when used as food, are nutritious and palatable, and contribute to a balanced diet in a healthy human population.

This publication is a compilation of papers presented at a symposium held at the 1982 annual meetings of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America in Anaheim, Calif. It treats the role of plants as nutrient sources, and presents an in depth review of how plant genotype, production practices, soil fertility, and product processing affect the composition in nutritive value of plant products. The material should be valuable to researchers, educators, students, and administrators in charting future actions, and activity for improving plant products as nutrient sources for humans.

We are indebted to the authors for preparing the technical reports, to the members of the organizing and editorial committees for guiding the symposium and developing this publication, and to the staff at Society Headquarters for editing and production.

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Preface

Plant foods are important sources of many nutrients for humans. They contain essential fatty acids, amino acids, carbohydrates, vitamins, and minerals. Yet, the nutrient composition of various food crops is not always optimal to meet the nutritional requirements of humans. Insufficient levels of various nutrients in some food crops, the presence of various "antinutritive" factors, and various processing and refining practices can change the nutritive value of many plant foods. Agronomists and horticulturists generally recognize that crop yields reflect the response of genetic systems to a range of environments, but the associated impacts of these variables on nutritional quality are less well defined. In order to improve the nutritional quality of crops, there is a need for agricultural scientists to be more informed of the concerns and priorities that food scientists and human nutritionists have regarding the factors affecting the quality of these foods. Agricultural scientists should be aware of the potentials that exist for improving the nutritional quality of crops through cultural practices or by breeding. Future developments in genetic engineering may also prove to be a useful means of altering nutritional quality.

This symposium, held on 2 Dec. 1982 at the annual meetings in Anaheim, Calif. is sponsored by Div. S-4 and C-6. It was organized by Dr. Ross M. Welch in response to a request from Dr. David L. Grunes. The information from this symposium should serve as a reference source for students and professionals concerned and interested in improving the nutritional quality of economic crops.

The participants were asked to emphasize general principles. Hopefully "Crops as Sources of Nutrients for Humans" will enhance interdisciplinary efforts which are essential if more nutritious crops are to be bred and produced.

As gross crop yields approach a ceiling, improvements in the nutritional composition of crops should become a more important agricultural strategy.

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