

General Introduction

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Agriculture Handbook 66 (HB-66) represents a complete revision of the 1986 edition. It has been reorganized and now includes 13 Chapters and 138 Commodity Summaries written by nearly 100 different experts in postharvest biology and technology. Unlike previous editions of HB-66 in 1968, 1977 and 1986, which were revisions of the original HB-66 completed in 1954, this 2004 edition not only presents summaries of the storage requirements of fresh fruits, vegetables, cut flowers, and other horticultural crops, but also includes information on quality characteristics, maturity indices, grading, packaging, pre-cooling, retail display, chilling sensitivity, ethylene production and sensitivity, respiration rates, physiological disorders, postharvest pathology, quarantine issues, and suitability as fresh-cut product. In addition, a number of fruits and vegetables were added, as well as sections on food safety and fresh-cut produce.

The purpose of storing plant material is to lengthen the time it can be consumed or utilized. In doing so, it is critical to provide an environment that minimizes deterioration, maintaining safety and quality while lengthening the marketing- or shelf-life. The intent of HB-66 is to provide guidelines for storing produce in an optimal environment in order to accomplish this.

HB-66 is intended as a general reference, and the recommendations should not be considered absolute, but rather as safe limits at which products can ordinarily be handled and stored. HB-66 is also available in PDF format on the Internet at <http://www.ba.ars.usda.gov/hb66>. Because of this, more frequent updates can be made, and users are encouraged to check this site for updates to the information provided in the hardcopy. For more information or to comment, send an e-mail to Dr. Kenneth C. Gross at HB66@ba.ars.usda.gov.

Each contribution was peer-reviewed by another individual knowledgeable in that particular area or commodity as well as two of the Editors. This review process helped to ensure that the information in this revision of HB-66 is as accurate and current as possible. The Editors would like to express their sincere appreciation to all of the authors and to the reviewers who are listed in the Acknowledgement section.

The original HB-66 by R.C. Wright, D.H. Rose and T.M. Whiteman, all from the USDA/ARS, was published in 1954. Then in 1968, the first edition was revised by J.M. Lutz and R.E. Hardenburg, both from the USDA/ARS. A substantial and extensive revision by R.E. Hardenburg, A.E. Watada and C.Y. Wang, of the USDA/ARS Horticultural Crops Quality Laboratory (now the Produce Quality and Safety Laboratory) in Beltsville, MD was completed and published in 1986. Ten-thousand copies of the 1986 revision, which have been interpreted into several different languages, were reprinted in 1990, very few of which remain. It was clearly time for an extensive revision, both to bring the content up-to-date and to increase its availability.

Most temperatures are shown in both °C and °F. Nevertheless, the following “Temperature Conversion Chart” can be used to convert temperatures from one scale to the other. Although temperatures are often expressed to the first decimal place due to rounding, this does not mean this level of accuracy is recommended, necessary or possible in a commercial situation. Generally, storage temperatures can only be expected to be maintained within ± 1 °C. Also, see the “Metric Conversion Chart” for some common metric conversions. Respiration and ethylene production rates for many fruits and vegetables are summarized in the section entitled such. Further, a “Commodity Cross-reference Index” has been included to aid in finding the Commodity Summary for produce called by various names in different cultures and geographical locations.

*“In this work, when it shall be found that much is omitted,
let it not be forgotten that much likewise is performed”*

Dr. Samuel Johnson, 1775