Pecan Technology

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Edited by
Charles R. Santerre

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DEDICATION

To all those who have contributed to, or will contribute to, the success of the pecan industry.

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Foreword

Flavorwise and texturewise pecans are the “Queen of the Edible Nuts.” This has been verified by salters, bakers, confectioners and ice cream manufacturers in America and western Europe. Hickory nuts and macadamia nuts are close behind, but are available only in limited supply.

Pecans are among the nuts highest in oil content. In general, the varieties of nuts with the highest oil content are also rich in flavor and tender in texture. Some varieties of pecans (i.e., Schley and Curtis) have been shown to contain as much as 76% oil. The oil in pecans is highly unsaturated, which means it is desirable from a nutritional standpoint but that it is also highly susceptible to oxidation which can cause pecans to turn stale and rancid. Pecans used in confections, bakery goods, cereals, or in snacks are more subject to staleness and rancidity than most nuts because these products are often stored at ambient temperatures. For this reason, pecans are considered to be semi-perishable and are not used in some “fine” products due to their limited shelf-life. Research at the Georgia Experiment Station has shown that raw pecans or most pecan products may be held in good condition for more than 20 years if freezing is the mode of preservation. However, development of new products demands that pecans be stored at ambient temperatures for extended intervals.

Pecan ‘meat’ is easily bruised during shelling and handling. Bruising ruptures the epidermal cell walls and releases free oil to the kernel surface where it is exposed to oxygen which can lead to oxidation and rancid flavor development. Therefore, pecans require careful handling and better packaging than many other nuts due to their chemical and physical nature.

Roasting pecans during processing increases the rate of staleness and subsequent rancidification by at least four times by destroying the natural antioxidants or by releasing oxidizable lipids from stable compartments within the cells. For example, roasted pecan halves placed in clear bags and held at room temperature

Preface

From 1970 to the mid-1980s, the pecan industry has been rather static in growth when compared to other tree nuts, such as almonds. During this time frame, pecan production has increased 34% and consumption has increased 31%, while almond production has increased 300% and consumption has increased 57%.* The real price (which adjusts for inflation) of pecans has dropped 50% while the real price of almonds has dropped 39% even though almond production grew almost ten-fold greater than did pecan production. One reason for the success of the almond industry has been market expansion due to aggressive promotion efforts both in domestic and foreign markets. Foreign sales of almonds have increased 220% while foreign sales of pecans have increased by only 10%. The pecan industry must use a similar approach to market expansion as implemented by the almond industry. Furthermore, technological advances are necessary to reduce or eliminate problems associated with using pecans in food products (i.e., limited shelf-life, contamination by weevil-larvae or shell-fragments, and adverse interactions between pecans and other components in food products).

This book discusses many factors which influence pecan quality from growth in the orchard, to harvest, and through processing. Extensive information is presented regarding variety, cultural conditions, mechanization, processing, storage, prevention of spoilage, and methods for evaluating the quality of pecans. In addition, information will be presented from surveys of growers and processors to determine a relationship between price paid for pecans and pecan quality.

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*Mizelle, W. O. 1989. Tree nuts: Production, prices, consumption and foreign trade. *University of Georgia Cooperative Extension Service*. Miscellaneous Publication No. 328:1-20.

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