

COMPREHENSIVE RESEARCH ON PRUNES

PROGRAM AREA: Program 48, "Food Technology and Engineering--Applied and Developmental Research".

PROJECT NUMBER & TITLE: Program 48, Project 2603, "An Investigation of the Dehydration of Fruits and Processing and Storage of Dried Fruits".

PROJECT LEADER: M. W. Miller

PERSONNEL: 1 Faculty, 2 Laboratory Technicians, 2 Graduate and 2 Undergraduate students.

OBJECTIVES: During 1972 three subject areas were under investigation. In the main these were continuations of studies initiated earlier under the Comprehensive Prune Program in cooperation with the California Prune Advisory Board. These areas are: The effect upon the composition of dried French prunes which had been treated with Alar during the growing season to even-out maturity and to accelerate ripening. Determination of average compositional and nutritive values, including trace elements, for prunes and prune products. Improvement of prune products, especially the flavor of prune juices. In addition information and literature on moisture barrier additives which may be applicable to treating prune products are being searched and collected.

WORK IN PROGRESS AND COMPLETED: Work on the dried prune samples collected in cooperation with Pomology Extension personnel and Farm Advisors from the 1971 crop season was completed during 1972. Over 6000 analyses on 116 different samples (including untreated controls) were done and the data compiled. In addition to the analyses mentioned in the annual report for 1971 determination of trace elements were included for compositional information as follows: zinc, nickel cobalt, arsenic, selenium, mercury, cadmium and lead.

Fractionation of natural prune flavor was completed in 1972 as well as those experiments concerned with the trapping of natural prune volatiles and subsequent add-back to the finished product. Heating during drying and during processing apparently are responsible for the losses and changes of these components and inability to recapture and add-back the prune flavor. Testing of natural flavors other than prune for improvement and "standardization" were carried on during the year.

Analyses were continued to determine the compositional and nutritive values of prunes and products. Tables are being compiled for the proposed revision of the USDA handbook No. 8 and for the CPAB nutritive booklet.

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MAJOR ACCOMPLISHMENTS: Should the application of Alar on fresh prunes be sought by the industry for reducing the maturity range of harvested fruit and for accelerating the ripening (for earlier harvest dates), the effect of this treatment upon the composition of the dried prunes is known for one crop year (1971). No significant differences between treated samples and control fruit were found at levels that might be used in the orchards. Preliminary report given at Prune Day 1972.

Compositional and nutritive values for prunes, prune juice and prune juice concentrates have been done and compiled so that this information can be sent for inclusion in the revised edition of USDA Handbook No. 8 which is to be done this coming year. This information is also to be included in material available to institutions and the public. Analyses on the trace elements give the first data on their presence/absence in prunes. Tables of values have been sent to CPAB.

IMMEDIATELY APPLICABLE RESEARCH RESULTS: The information stated under "Major Accomplishments" is immediately applicable.

WORK PLANNED: Depending upon priorities placed on the various areas of study some or all of the following should be included in future plans. These areas are based upon past and present contact with the prune industry where indications are that information is inadequate or not available to the public.

Prune products used in remanufacturing, i.e., prune juice concentrate, paste, diced prunes, etc., generally are not sterile. Extremely scant information is available regarding the yeast, mold and bacterial populations that might reasonably be expected to be encountered. A systematic study is necessary to provide information to the users of these products as to standards and criteria of microbial levels.

Regarding the microbial content of prune products for remanufacture it may very well (in fact would) be necessary to determine the possible sources of contamination as affected by dehydration, storage, and processing equipment and conditions.

Prune products other than processed prunes, juice and concentrate have not been analyzed for compositional variations. Values cited are calculated from data of processed prunes making adjustments for moisture content. With the prospect of nutritional labeling definite data should be acquired for pastes, canned prunes, etc.

More practical work is needed on preservatives used or of potential use for processed prunes. Relationships of useful concentrations versus moisture content, acidity, etc. are not known. Effects of combinations of allowable microbial inhibitors and in which proportions and levels very definitely needs to be studied for both domestic and foreign outlets.

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EVALUATION OF PROJECT: Evaluation of accomplishments in 1972 must take into account the purpose of the Comprehensive Prune Research Plan over the past several years. It is felt that the original aims and intent of the program have been well met and certainly the studies completed and work in progress would not have progressed as rapidly, in fact it would not have been possible to do everything in the absence of the comprehensive program. The data now available provides a storehouse of information, most of which is applicable immediately.