PRUNES improved packing procedure and new use for cull fruit developed

Superior Quality Pack for Special Markets Possible by New Procedure

E. M. Mrak and H. J. Phaff

A new procedure for packing prunes is feasible for small-scale operators who can pack their entire output of superior fruit for special markets.

The fruit is very palatable although the skin is somewhat tough. The fruity flavor and yellow-to-amber flesh color of the fresh fruit is retained for some time.

In prune-producing areas where the fruit remains on the tree until harvest, picking should start while the fruit is still firm, but ripe for eating.

The period of desired maturity for harvesting lasts about 10 days. After this, the fruit starts to deteriorate by developing gas pockets, becoming discolored and losing sugar. The harvest period recommended for prunes that do not fall naturally is much earlier than in present commercial practice. Ordinarily it is not possible to dehydrate all the fruit in the short period suggested for harvesting.

In order to obtain a superior dried product it is recommended that all the fruit be harvested during the short period of its optimum maturity—midseason—and that which cannot be dehydrated immediately, be held in cold storage until dehydration facilities are available.

This practice has been tried experimentally during two seasons and it was observed that the dried product prepared from fruit harvested at the optimum maturity and held in cold storage is much superior to that prepared from prunes allowed to remain on the trees until later in the season.

The fruit should be thoroughly washed. The use of lye tends to reduce toughness of the skins, but may have an adverse effect on color, if sufficiently strong to cause checking. This is particularly true for prunes produced in the Sacramento Valley.

To obtain even drying and to prevent scorching of the small fruit, size grading of the fresh fruit into two grades is desirable. Removal of inferior fruit at the time of traying also is a desirable practice. Size and quality grading of the fresh fruit is considered costly and uneconomical under present conditions.

Dehydrate at not over 165° F in a counter current tunnel having an air flow of at least 600 lineal feet per minute. The two-stage—parallel-counter flow—system can be used to advantage when reduction of the drying time is important. At present, however, there are few if any two-stage prune dehydraters in California.

The fruit must be removed from the tunnel at 29–32% moisture. This is difficult because of uneven drying, unless the fresh fruit has been graded for size.

The car of trays loaded with prunes is then introduced into a cabinet blancher where the fruit is blanched about four minutes in live steam.

The car is removed and the fruit permitted to cool by standing in moving air if possible.

The fruit is then sorted and packed into moisture proof, heat sealable containers.

Microbial spoilage, which takes place very rapidly at 30–32% moisture content is eliminated by adding about 1–1.5 ml. of propylene oxide to each two pound bag just prior to sealing.

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Studies Indicate Nutritional Value of Culls in Commercial Dog Foods

Agnes Fay Morgan and Mary Groody

Cull prunes may solve some of the problems involved in providing nutritionally adequate, low-cost constituents for dog foods as economical sources of protein and vitamin-rich foods become scarce.

Laboratory studies at the University of California furnish new evidence that the nutritional value of prunes can be utilized to advantage by dogs.

Basal diets of mixtures of well-known commercial dog foods were chosen for a series of experimental studies of dogs to determine the supplementary value of cull prunes in their diet.

To observe the effect of the addition of prunes, 20% of the solids of the basal diets was replaced by prune pulp or whole prune paste for half of the members of each litter of dogs studied.

It was assumed that dogs fed only the basal diets of commercial dog foods would grow satisfactorily and the performance of the prune-fed animals would offer some index of the value of the prunes as a part of such diets.

Since no comparison of the commercial foods was planned, mixtures rather than single foods were chosen.

A dry food mixture was made up of five well-known brands of dog food, and a canned food mixture likewise was made up of five well-known brands.

Each mixture was repeatedly sampled and chemically analyzed.

Neither advantage nor disadvantage was noted as a result of the inclusion of the tested amount of prune pulp in the canned food ration.

The prune and dry food-fed dogs grew better at all stages than did those receiving the dry food alone.

During the last four months of an eleven-month feeding period, two of the dogs received a whole-prune paste made by grinding pits and pulp, while a third dog continued to receive only the prune pulp.

The paste appeared to be better utilized than the pulp, and no disadvantage from its use could be observed during these experiments.

Prunes are known to contain measurable quantities of carotene, thiamin, riboflavin, pantothenic acid, and nicotinic acid, as well as mineral constituents, sugars, a laxative principle, and no doubt several unidentified nutrients.

Dry dog foods are known to be subject to loss of carotene or Vitamin A in storage and the carotene content of the prunes was thought to be of importance in the improvement of such foods.

It is probable that most of the vitamin A in the canned dog food was due to liver, kidney, or fish oil, and that the dry foods contained largely carotene, or that the fish-liver-oil vitamin A, if originally present in the dry foods, was partly destroyed in storage. Carotene and vitamin A, when mixed in finely powdered or pelletted diets in contact with air, are known to be subject to oxidation.

All of the dogs fed the canned food had large reserves of vitamin A in the livers and no difference due to the prune feeding could be seen. Among those dogs fed on dry food,

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Liquid Sugars

studied in the freezing of apricots, peaches and nectarines

M. A. Joslyn

Experimental packs of frozen apricots, peaches and nectarines—to study the protective effect of sugar—were begun in the summer of 1946.

The studies were conducted to investigate the various methods of applying sirup; to compare sucrose-sirups with those containing 30%, 50%, and 90% invert sirup, and with sirups prepared from corn sugar, low conversion and high conversion corn sirup; and to compare the effectiveness of several antioxidants both with and without added citric acid.

The average scores for the Blenheim apricots used in the studies indicated relatively little difference in appearance between apricots frozen in sucrose sirups and those frozen in invert sirups at the first and second testing, but a definite decrease in score due to progressive discoloration in all invert sirups was apparent at the last testing.

There was no definite trend in texture, probably due to variability of samples, except a marked increase in relative toughening of the skin with increase in storage period.

In flavor, at the first testing, there was a noticeable difference between the 70% invert sirups and those of lower degree of inversion. This difference persisted in subsequent testing. There was a noticeable decrease in flavor retention with storage time, the decrease being greater in apricots packed in invert sirups than those packed in sucrose sirups.

Peaches

In the Rio Oso Gem peaches studied there was little readily detectable difference in color between fruit frozen in sucrose sirups and those frozen in invert sirups at the first testing, except at 90% inversion.

The color score decreased with the lengthening of storage time, the decrease being most noticeable at eight months, but it was similar in sucrose and invert sirups.

There was a noticeable decrease in texture at 90% inversion, but the trend was not definite owing to variations within the samples. The texture of the samples was appreciably poorer with increase in storage time.

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The exact dosage used will depend on the conditions under which the sterilizing agent is added and on the type of package used.

Propylene oxide boils at 95° F., so it must be kept cool at all times prior to application.

The container must be sealed immediately after the addition of propylene oxide in order to prevent its loss by volatilization.

As soon as the bag is sealed, it should be placed in a case which must be tightly sealed immediately after being filled. This procedure is necessary in order to enable sterilization of the fruit.

The sealed cases should be stored in a cool place, preferably cold storage if possible.

Fruit packed according to the procedure outlined here has a superior flavor which it retains even after several months of adverse storage at 80° F. Although the flesh darkens slowly, the skins tend to attain a purple color during storage. This is particularly true of skins showing little color when first dried.

The procedure outlined above is not feasible for large commercial operations. It would be impossible to pack all dried prunes as they are taken from the dehydrater. For the present it would even be difficult to attain universal acceptance of the idea of blanching with the view of improving quality of the dried product.

In commercial practice it is customary to treat prunes in boiling water—processing—prior to packaging. This treatment probably inactivates the enzymes. However, since packaging is ordinarily done several months after drying a great deal of enzyme deterioration can take place in storage before the fruit is processed.

Until the procedure is given further consideration in the way of large-scale trials under commercial conditions, recommendation of its widespread use is not justified.

E. M. Mrak is Professor of Food Technology and Mycologist in the Experiment Station, Berkeley.

H. J. Phaff is Assistant Professor of Food Technology and Assistant Microbiologist in the Experiment Station, Berkeley.

The studies covered by this report were conducted by C. N. Chari and C. P. Natarajan, graduate students in the Division of Food Technology, under the direction of Dr. E. M. Mrak and Dr. H. J. Phaff.

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much smaller stores of vitamin A were found.

In the first generation on dry food, one prune-fed female had nearly three times as much liver vitamin A as the nonprune-fed female, and the prune-fed male had more than twice as much as that stored by the nonprune-fed male.

It is interesting to note that the females, regardless of diet, had considerably larger liver vitamin A stores than the comparable males. Probably this may be ascribed to the greatly increased food intake which accompanied reproduction.

Three dogs of the second generation as well as three of the first generation were given whole prune paste containing pulverized pits. They made good growth and maintained normal health.

In a series of digestibility experiments with whole and ground prunes, it was noted by other experimenters that hogs, sheep and cattle utilized prunes in both forms very well and that hogs and cattle cracked the kernels and swallowed the pits when the prunes were fed whole.

The prune feed is low in protein and must be supplemented with protein-rich roughages or concentrates, and because of its laxative nature should not be overfed. For dogs, the proportion used may be as great as 20% of the dry feed.

The dogs fed canned food, either with or without prunes, had 10 to 20 times as much liver vitamin A as those fed the dry food but among the latter, the prune-fed dogs, especially of the first generation, had larger stores than did the nonprune-fed dogs.

The prune supplement appeared to make a contribution of provitamin A to the dry food mixture, but this cannot be assumed to explain in full the favorable results.

Whole prunes ground to a paste and including pits were used in several cases and found to be as satisfactory as the prune flesh alone.

It is concluded that such prune paste may be regarded as an advantageous ingredient of dog foods.

Agnes Fay Morgan is Professor of Home Economics and Biochemist in the Agricultural Experiment Station, Berkeley.

Mary E. Groody was Principal Laboratory Technician, Department of Home Economics, Berkeley, during these studies.