and warm storage are known to bring about transformations in the cell structure of plant tissue that might result in changes at the interfaces concerned, thereby increasing the permeability of the chromoplasts when exposed to short cooking.

Canning, on the other hand, subjected the carrots to higher temperatures for a longer period of time, which might readily have caused a weakening in the boundary films of the chromoplasts. When tested for vitamin A in the fall immediately after canning, its availability was comparable to raw carrot but was greater than that of carrots cooked for only a short period. When these canned carrots were kept for six months and then tested, they showed a decided loss in vitamin A potency, that might be due to greater susceptibility to oxidation resulting from greater availability after canning.

VITAMIN B (COMPLEX) AND B_1

Vitamin B_1, in its simple or complex form, is water-soluble and, as previously mentioned, undoubtedly resides in the aqueous part of the cytoplasm of the cells. When either potato or carrot is ingested in a raw form, at the point of maturity in the fall or after warm and cool storage, vitamins B_1 or B (complex) appear to be available to a maximum degree. After boiling for 25 minutes, however, there is a distinct loss in the potency of these vitamins, with the exception of potatoes in the fall. This change in potency might again be explained as due to changes in cell conditions that permit the release of the solution of vitamin B and its ready oxidation before being ingested. During the canning process, vitamin B_1 in carrots undergoes a slight loss in potency in the pressure cooker, but no loss when canned in the oven. When the canned carrots were again tested in the spring, they showed a pronounced loss in potency. This might be attributed to oxidation of the vitamin after it is made more available by the canning process.

VITAMIN C

This vitamin is also water-soluble, and for this reason may be regarded as occurring in the aqueous part of the cell. Results from our animal feeding experiments indicate that the vitamin C potency of raw carrot increases during either cool or warm storage. This increase is greater, however, in carrots from warm storage. Because of this evident increase, the authors believe that the total amount of vitamin C present in the raw fall carrot is not available to the consuming animal. It is again assumed that during storage cellular changes occur, which render the vitamin C in the carrot available to a greater degree, especially when stored in a warm, dry cellar. The fall carrot, when cooked for a short period, offers slightly more protection from scurvy than it did in the raw form. It would seem then as if cooking produced some changes that also made vitamin C somewhat more available. Tests made on stored carrots when cooked show, on the other hand, some loss of vitamin C in the case of cool storage, and definite loss in warm storage. As the tests of raw carrot from these storages indicate a greater availability of vitamin C, it is apparent that this vitamin has become more susceptible to oxidation during cooking. This point is more strongly emphasized in the pronounced progressive loss of vitamin C potency in canned carrots that were kept for six months.

The preceding summary of a five-year study of the vitamin C potency of potatoes, before and after storage, shows some agreement with the results of the carrot investigations. Again there is an increase in vitamin C potency in the raw potatoes from warm storage, which suggests greater availability. Also, as in carrot, there is greater loss of vitamin C potency in stored potatoes after cooking than in the fall, indicating susceptibility to oxidation.

It is interesting to note the data on animal growth (C_g) that were observed while testing the anti-scorbutic potency of potatoes and carrots. Their variations do not always coincide, but again there appears to be an increase in the growth tendency after storage, which only strengthens the theory of greater availability.

JESSIE E. RICHARDSON,
HELEN L. MAYFIELD
HOME ECONOMICS DEPARTMENT,
MONTANA AGRICULTURAL
EXPERIMENT STATION

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