# *Vegetables: Succulent Roots and Bulbs*

*Radish*

**THE SUCCULENT ROOTS** are so designated on account of their comparatively large percentage of water, which ranges from 75 to 90%. While they are not as rich in alkaline elements as the green vegetables, they do yield a sufficient quantity of basic-ash residue to render them valuable adjuncts to the diet, if properly prepared. Beets, carrots, and some of the radishes come closest to the green vegetables in alkaline properties.

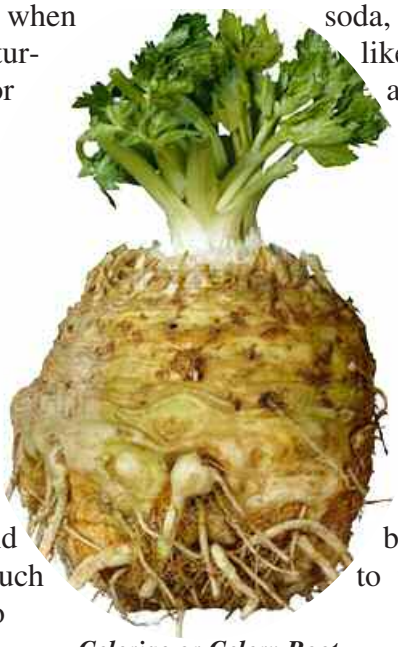
**Beets** are cultivated in many varieties throughout the temperate and subtropical zones, the most common of which are the white or yellow, and the red types. A considerable portion of the carbohydrates contained in beets is chemically known as cane sugar, which in the best varieties often ranges from 20 to 30%. Sugar beets, if cut into small pieces and boiled in just enough water to cover them. resemble very much stewed apples, and the water in which they are immersed makes a wholesome, nutritious drink when cooled. Here one has the natural sugar (sucrose) of the beet and most of the alkaline elements which are completely removed when beets are subjected to the refining process of sugar manufacturing.

Finely grated white or red beets are often used uncooked for salads, in combination with other raw vegetables. For such purpose young tender beets are much to be preferred to the older roots, as the latter contain too much cellulose; a conversion from sugars into starches has taken place in the older roots. The roots may also be baked like potatoes, which is the best way to prepare them for those whose digestive organs are impaired. When beets are cooked in water, the fluid should always be carefully preserved, as it contains a large portion of sugar and organic salts. The beet tops and stems should never be discarded, especially those of the red variety, and they should always be used while fresh when their vitamin and mineral potencies are at their maximum. The leaves may be finely minced and consumed raw, or they may be simmered in just enough of the water that clings to the tops until they attain a wilted condition, analogous to the steaming of spinach. Indeed, red beet tops excel spinach in iron and other organic salts.

**Carrots**: Young roots are more satisfactory than older ones, as the latter have a tendency to become woody, especially at the core. As in beets, the carbohydrates of the carrot consist of a large percentage of sugar, often as much as 12%, although 6 to 7% constitutes an average. The mineral matter predominates in all the principal alkaline elements — potash, soda, lime, magnesia (sources of potassium, sodium, calcium, and magnesium, respectively), and iron making up about 75% of the total amount of salts. If carrots are finely grated, a process which breaks up the cells, a rich, juicy and sweet pulp will be obtained, which is easily digested even by the weakest of stomachs. If the pulp is mechanically juiced or pressed through a cheese cloth and carefully strained, it may occasionally be given to infants. The extraction of the juice by

means of hand or juicer (Acme, Champion, Norwalk) affords a delightful drink abounding in beneficent nutrients. Like beets, when carrots are not consumed in their natural raw state, they are best steamed or baked in order to avoid appreciable loss in organic salts. With proper care they may also be boiled or stewed.

**Radishes**: While radishes are grown in over forty varieties in all kinds of shapes and colors, the most commonly known in the United States are the small ones with red exterior and white flesh. The roots have a very fine flavor and when young are crisp, juicy, and tender; but when old, they contain much woody fiber, which is difficult to digest. The pungent flavor of radishes is due to organic compounds containing sulphur, similar to the essential oil in mustard.



*Celeriac or Celery Root*

In addition to the small pink and red radishes, there are some large varieties cultivated, among which the Japanese white radish and the black radish are best known. Radishes are preferably eaten in their natural state or grated in combination salads. The mineral matter of the larger radishes especially abounds in potash, lime, iron, and sulphur. Radish leaves may be used in soups, acid if very tender, added to salads.

**Turnips**: Innumerable varieties of turnips are grown throughout the temperate zones, of which the most common are the white and yellow varieties, and the Swedish turnip or rutabaga. In summer the early white varieties are usually preferred, while during winter the yellow turnips are more frequently consumed. The flavor of the turnip, like that of the cabbage and radishes, is primarily due to compounds of sulphur. In cooking, these pungent substances are broken down to some extent and pass off into the air. The carbohydrates of turnips are made up of glucose, sugar, pectose, pentosans, and crude fiber. The mineral matter is rich in potash, soda, and magnesia. Turnips may be baked like a potato, they lend flavor to soups and stews, but are particularly delightful when grated raw and mixed with other salad vegetables.

*Kohlrabi (Brassica oleracea)*

**Kohlrabi** or turnip-rooted cabbage is another variety of the turnip and cabbage family, in which the reserve food of the plant is stored up in a tuber-like enlargement of the stem, just above the ground. In flavor it is more delicate than is either the turnip or cabbage. It can be either baked or cooked with other vegetables, to which some of the kohlrabi leaves may be added.

**Celeriac** (celery root) is the name applied to one variety of celery, which is grown chiefly for its roots, resembling the parsnip in color, but being more or less globular in shape, like turnips. The composition is very much like that of the other succulent roots. Potash, sodium, and chlorine predominate in the mineral matter. Celeriac has a pronounced celery flavor, which is rather strong in the raw root, due to the presence of an essential oil occurring also in the seed. If baked and sliced, it makes a wholesome and delicious addition to salad. It lends a characteristic touch when diced into soups and stews.

**Salsify** is the name generally given to the common white salsify, known also as oyster plant or vegetable oyster, the black salsify, the Schwarz Wurzel of the German, and the Spanish salsify. Both common and black salsify resemble the other succulent roots in general character. The principle carbohydrate stored in black salsify is inulin, which is transformed into sugar by the action of hydrochloric acid in the stomach. Inulin replaces starch in many plants as reserve

carbohydrate, and from a physiological point of view it serves the same purpose in the body. The leaves of salsify, if young and crisp, may be eaten as a salad. In the mineral matter of this vegetable, potash, lime, magnesia, and iron constitute the larger portion.

**Onions**, **Garlic**, **Leek**, and **Chives** are all members of the large onion family and are characterized by the presence of an acrid volatile principle, an oil-like organic compound of sulphur, which gives them very valuable purifying properties. They form an important class of vegetables, whether used in the cooked or raw state. Onions grown in warm countries have a mild flavor, owing to a smaller amount of the acrid principle than is contained in those of colder countries. Onions, like lettuce, have a soporific effect. Chives and leeks develop very small bulbs and are usually grown for their leaves. Leeks are used as a green vegetable or pot herb, while chives are mostly for seasoning. Parsley helps to dispel onion odors.

*Leeks*

The chemical composition of onions varies according to-the stage of growth and variety, but is similar to that of the other succulent roots. Onions, if stored for a while, lose some of their water and consequently change the proportion of their solid contents. The average composition of onions is as follows: water 60 to 90 %; protein 1.0 to 5.0%; fat 0.1 to 0.8%; carbohydrates 5.0 to 25.0%: mineral matter 0.5 to 1.2%. On account of their large contents of lime and iron, onions and leeks are especially beneficial to anemic and diabetic people.

Garlic is the most strongly flavored of the plants of the onion family. It produces a collection of small bulbs, called cloves, in place of one large bulb. Rightly used, it may add to the palatability of salads and many other dishes. It is an effective intestinal germicide.

**Asparagus**: It is valued for its young and tender shoots, which are generally boiled, but which may be used also uncooked in combination salads when tender. Asparagus is especially rich in sodium, calcium, iron, and sulphur. It also contains a nitrogenous principle called "asparagin," which has diuretic properties. The strong odor of the urine after eating asparagus is caused by a volatile sulphur compound.

**Horseradish** is a plant of the mustard family. Its root is long, rather slender, and has a sharp, peppery flavor owing to the presence of an essential oil which is dissipated by drying. This oil resembles in general character those occurring in the radish and other members of the mustard family. Horseradish is generally grated raw, serving as a condiment rather than a food in diet. Taken moderately in salads, and without vinegar, it promotes the flow of the digestive juices. It may also be cooked with other vegetables. Its chemical analysis shows: water 86.4%; protein 1.4%; fat 0.2%; total carbohydrates (mostly starch) 10.5%; mineral matter 1.5%. The mineral matter consists chiefly of potash, lime, magnesia; and sulphur. Containing as it does a very large amount of sulphur in organized form, horseradish is one of the most valuable anti-scorbutic (scurvy-preventing) vegetables.

**Ginger** is a stimulating aromatic spice, much used in baking. The ginger root consists of: water 85.6%; protein 1.0%; fat 0.6%; sugar and starch 11.4%; crude fiber 1.0%; mineral matter 1.4%. Of the total fat, about half consists of the ethereal oil which, together with a pungent, nonvolatile constituent called gingerol, gives to ginger its characteristic flavor. Ginger may be used occasionally in very small quantities as a spice in bread, but confections and beverages made from ginger should be avoided.

**Sassafras** is a small tree growing along the Atlantic Coast. The bark of the small stems, and especially the root, yields a flavoring extract valued in the preparation of beverages and confectionery. A tea made from the roots is still used to some extent in the home, and commercially. ❒

—Lillian Carque