

Chapter 1

What is Cereal Grass?

“There seems to be no reason why grasses, suitably prepared, should not be consumed by man with great benefit from the standpoint of general health and especially the prevention of degenerative disease.”

—Charles Schnabel¹²³

Grasses inhabit the Earth in greater abundance than any other land plants. A large number of grass species have adapted to a wide variety of climatic conditions and soil types. The native grasslands in the American West once totaled over 700 million acres.⁴⁵ For thousands of years these tall prairie grasses sustained the life of the bison, antelope and deer who roamed over them.

Jacob Bronowski, in *The Ascent of Man*,¹³ describes the miraculous genetic accident that might have occurred about 8,000 B.C., producing the bread wheat plant. The cultivation of grasses and the harvest of their grains have sustained the human population for many centuries. Agriculture has made possible the development of many of the world’s great civilizations.¹¹⁸ Wheat was a staple food crop for Egyptians as early as 5000 B.C.¹⁴⁸ The goddess Isis is said to have brought wheat and barley grains to the people of Egypt from Lebanon.⁶¹ Wild ancestors to modern wheat plants still grow along the Nile.

The principal cultivated grasses are the cereal grains—wheat, rice, corn, barley, oats, rye and millet. Wheat is planted on more acreage than any other crop. It is grown most effectively in “grassland” climates, which have the appropriate level of rainfall and include a cold season.³

When the cereal plant is young, it looks something like familiar lawn and field grasses. It is leafy and has a deep green color. For over fifty years, researchers have known that the cereal plant, at this young green stage, contains many times the level of vitamins, minerals and proteins found in the seed kernel, or grain product of the mature cereal plant (see figure 1.1).¹²² Grains are appropriate staple foods for animals, however, because they are excellent sources of food energy (carbohydrates) and contain adequate levels of important nutrients.

All Cereal Grasses Are Nutritionally Identical

The taste of young cereal grass leaves varies slightly with the species of cereal plant, from quite sweet (rye grass) to slightly bitter (barley grass). But the nutrient content of these grasses varies with their stage of growth and growing conditions, rather than with the species of cereal grass.⁶¹ Wheat grass and barley grass grown in the same field and harvested at the same growth stage are more similar nutritionally than two barley crops grown in different fields. This fact has been demonstrated in thousands of analyses run on all the cereal grasses.⁴⁷

HOW CEREAL GRASS GROWS

The Importance of Environment and Growth Stages

Cereal grasses, like all grasses and plants, pass through several stages as they grow to produce their seeds (the grain kernels). A specific sequence of growth events takes place as the cereal plant develops. Each stage is essential; the basis for each stage is the cell quality provided by the preceding stage.¹¹⁸ Specific environmental conditions—temperature, nutrients, and moisture—are required at each stage.

Figure 1.1 Wheat Grass vs Wheat

Nutrient Comparison (Per 100 Grams Dry Weight)

Nutrient	Wheat Grass	Whole Wheat Flour
Protein (gm)	32	13
Total Dietary Fiber (gm)	37	10
Carbohydrates (gm)	37	71
Vitamin A (I.U.)	23,136	0
Chlorophyll (mg)	543	0
Iron	34	4
Calcium (mg)	277	41
Vitamin C (mg)	51	0
Folic Acid (mcg)	100	38
Niacin (mg)	6.1	4.3
Riboflavin (mg)	2.03	.12

Sources: References 52 and 153

Plant growth and plant development are not the same things. A growing plant does not necessarily indicate a properly developing plant, or a plant which will produce seeds. For example, wheat plants can grow rapidly at room temperature, but cannot mature in the same way as wheat grown outdoors and exposed to appropriate seasonal temperature variations. The chemical and nutritional profiles of cereal grasses vary widely at different growth stages.

Cereal grass plants have a unique growth property. In the words of Dr. Charles Schnabel:¹²²

“In the battle for self preservation, grasses developed unusual resistance to grazing animals. Trees grew high out of reach, the cactus armed itself with spines, and grass plants evolved their unique property of jointing. In the early stages of growth they store large amounts of vitamins and proteins in the young blades. If these are bitten or pulled off, they grow again. Grass will give seeds to reproduce itself only if it is left alone at the final stage of growth.”

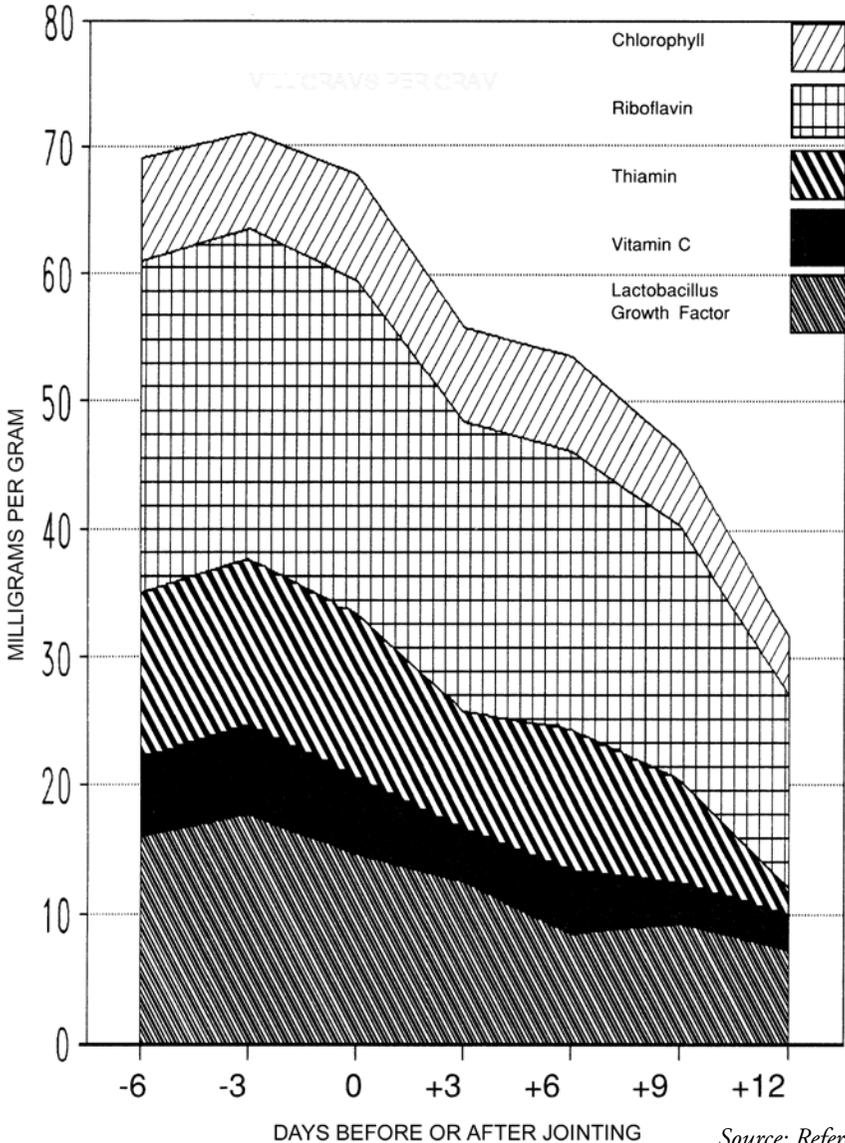
Grasses have the amazing ability to provide food for animals, without diminishing their own ability to reproduce! In prehistoric times, this meant that a herd could graze on a grass range, then move on to another area. After the young blades had been eaten, the grass plant would recover fully and grow to bear its “fruit” or the grain seed, insuring the presence of the grasses the following year. In modern times, it means that when cereal grasses are cut before they reach the jointing stage, the plant can, with adequate rainfall, recover and continue growing to provide a grain crop!

The cereal grain kernel is not only the food from which we make our flours, meals, and other grain products, it is the seed which produces the cereal grass plant.

The climate and soil conditions in some areas of the American central plains are particularly well suited for the growth of winter wheat and barley. After fall planting and germination, the grain produces a shoot which appears above the soil in a few days. The roots experience active growth from October until the advent of freezing temperatures,⁴⁰ then grow very slowly through the cold of winter and early spring. The short blades of grass above the soil also grow in the fall, then become dormant through the coldest weeks of winter. The cereal plant’s roots and leaves resume more active growth when temperatures rise in the spring.

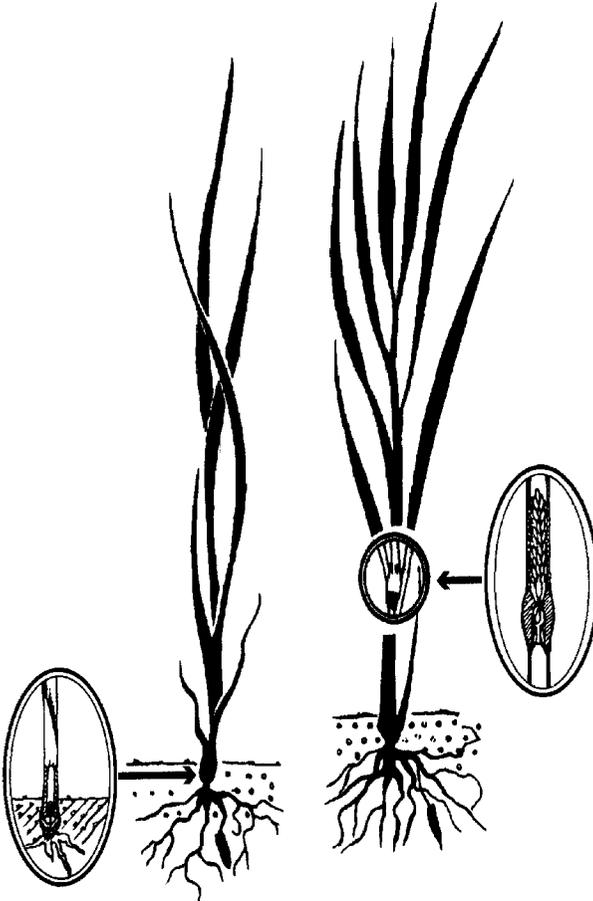
The young germinated plant is a factory of enzyme and growth activity. Photosynthesis in the young green leaves produces simple sugars which are transformed into proteins, carbohydrates and fats by the actions of numerous enzymes and substrates which were themselves produced from the plant sugars and minerals provided by the soil.²⁹

Figure 1.2 Cereal Grass: Nutrient Content vs Jointing Stage



Source: Reference 65

Figure 1.3 Jointing Stage of Young Cereal Grass



At left is a cereal grass plant during its highest nutrient period, the jointing stage. At right is the same plant one week later. Stored nutrients in the leaves supply nourishment for the growing seed head. After jointing, the nutritional level in the leaves drops rapidly while the fiber content increases rapidly.

Sucrose, the simple carbohydrate found in table sugar, is the primary molecule from which all organic (carbon containing) molecules are formed in the plant.²⁹ At the appropriate times and rates, sucrose is converted into amino acids (which make up all proteins), complex carbohydrates, lipids (fats), and nucleic acids (DNA and RNA). The degree of conversion of sugars to specific complex nutrients is dependent on the activity levels of specific enzymes in the plant. Enzyme activity levels are dependent on the plant's growth stage.

Winter wheat, for example, planted in a green house or in a warm climate, does not experience the environmental conditions necessary to produce normal root growth and leaf development.⁴⁰ Grasses grown in unsuitable environmental conditions may grow green leaves which are capable of producing simple sugars, but they lack enzyme systems which convert those sugars to the organic molecules necessary for the formation of a stem, stalk and grain seed.

The Jointing Stage: When Nutrients Reach Their Peak

Laboratory analyses clearly indicate that the nutrients found in young green cereal plants vary with the stage of growth, rather than with the age or height of the plant.⁶⁵ Chlorophyll, protein, and most of the vitamins found in cereal grasses reach their peak concentrations in the period just prior to the jointing stage of the green plant. Although this period lasts for only a few days, cereal grasses which are consumed as food supplements should be harvested precisely during this stage of the wheat or barley plant's development.

The jointing stage is that point at which the internodal tissue in the grass leaf begins to elongate, forming a stem. This stage represents the peak of the cereal plant's vegetative development;⁶⁵ factors involved in photosynthesis and plant metabolism would be expected to increase up to this stage.

After the jointing stage, the stem forms branches and continues to elongate. The chlorophyll, protein, and vitamin contents of the plant decline sharply as the level of cellulose increases (see figure 1.2). Cellulose, the indigestible plant fiber, provides structural stability for the growing stem.

Over a period of several months, the green leafy plants are transformed into golden stalks of grain. The mature cereal plant holds the seed grains which contain the nutrients necessary for germination and early growth of the young cereal plant. And so the seed-grass-grain cycle continues.

Home Grown Plants From Grain Seeds

It's easy to grow a grass-like plant from sprouted wheat grain at home. This plant is green and very sweet, but is quite different from the wheat grass described in this book. It is really more of a long sprout than a fully-developed grass. The plant is considered by many to be a good source of chlorophyll and an excellent detoxifying agent. This is the "wheatgrass" used by Dr. Ann Wigmore, Viktoras Kulvinskas, and many others in "alternative"

health therapies for many chronic diseases. This plant has some similarities to the wheat grass plant which has been studied and used for the past fifty years. Both are green plants which grow from wheat seeds.

Indoor, tray-grown “wheatgrass” is usually ready for cutting in five to seven days. The sprouts shoot up quickly from the wheat seeds which have been germinated in water; no soil is required. The wheat seeds are placed close together and kept in the dark for several days. This is a standard method used for sprouting seeds.

This “wheatgrass” grows quite differently from the wheat grass planted in the ground to produce grain. Although it is a lovely and useful green plant, it does not develop deep roots, absorb soil nutrients, or pass through the growth stages necessary to produce the nutritionally potent wheat grass we are describing here.

The quickly grown indoor “wheatgrass” will never reach the jointing stage and will never produce a grain kernel. The simple sugars produced in the shoots by photosynthesis are never converted to the complex nutrients found in the leaves of the young wheat plant grown in the soil in cold weather. As a result, the tray grown “wheatgrass” has a strong sweet taste.

The indoor variety tastes so strong that drinking even small amounts (less than one ounce) often makes first time users nauseous. This sickening feeling is said to be due to the strong “cleansing” properties of the tray-grown “wheatgrass.”

Certainly, there must be something in this plant which contributes to the remarkable recoveries reported by individuals who use the juice of this “wheatgrass” as therapy for chronic diseases. This plant and its juice is generally not consumed in large quantities, as is done with winter-grown wheat grass and its juice. Its value seems to be more that of a cleansing or medicinal agent than of a staple green vegetable food.

Why Eat Cereal Grass?

Dehydrated cereal grass is a convenient whole food which people eat as a green vegetable. There are many reasons why green foods are important, as will be seen in the following pages. We do not think that cereal grass should replace green foods in the diet. It is obvious that dehydrated cereal grass could never replace the flavor and satisfaction which spinach and broccoli lovers get from a big bowl of greens. But as green vegetables go, cereal grass is one of the most nutritious. And for those who have neither the time nor the will to

eat more conventional green vegetables, a serving of high-quality cereal grass is extremely convenient. Winter-grown dehydrated cereal grass is user-friendly.

Most of us grew up with our mothers telling us to eat our green vegetables. Today, many Americans do not like green vegetables and do not eat green vegetables, but feel they should. There is sort of a collective green food guilt which hangs over us. Even those who do like green vegetables sometimes think they cannot afford them or don't want to take the time to prepare them.

Figure 1.4 shows the nutritional profiles of cereal grass and other commonly consumed green vegetables. The green food which ranks lowest nutritionally is head lettuce. Lettuce is tasty and crisp, but it is composed mostly of water! Those who think they get their quota of green foods from eating a lettuce-based salad are mistaken. Of the vegetables listed, the one closest to containing the nutrients found in cereal grass is spinach.

Perhaps one of the most important advantages of dehydrated cereal grass over some other green vegetables is the way most American cereal grass is grown. As discussed in Chapter 9, most of the produce we eat is grown using a wide variety of herbicides, insecticides, and fungicides which may contribute to our risk of cancer and other diseases. Cereal grasses can easily be grown without pesticides. The leading American supplier of cereal grasses produces

Figure 1.4 Nutrient Value of Cereal Grass and Other Green Vegetables

Vegetable	Serving Size	Protein (Grams)	Fiber (Grams)	Carotene (IU of Vit A)	Iron (Mg.)	Calcium (Mg.)
Dehydrated Cereal Grass	2 tsp (5g)	1.11	.82	1157	1.7	14
Spinach (raw, finely chopped)	1/2 cup	.9	.2	2230	0.9	26
Alfalfa Sprouts	1/2 cup	2.6	.85	0	0.7	14
Iceberg Lettuce (finely chopped)	1/2 cup	.35	.18	125	0.2	7.5
Green Beans	1/2 cup	1.1	.55	330	.45	31

Sources: References 98 and 153

them without chemical sprays. The consumer can read the cereal grass product label to determine the “wholesomeness” of the environment in which it was grown.

What Is Cereal Grass? A Summary

Cereal grass is the young green plant which will grow to produce the cereal grain. All cereal grasses, including the green leaves of wheat, barley, rye and oats are nutritionally identical. These young grasses are, in their chemical and nutritional composition, very different from the mature seed grains.

Several growth stages are required for the development of nutritionally complete cereal grasses. Suitable soil, moisture, and temperature conditions are essential for the young wheat plant to pass through these developmental stages. The nutrients in the plant reach their peak values as they approach the brief, but critical, jointing stage.

The nutrient profile of cereal grass is similar to those of the most nutritious dark green leafy vegetables. The importance of green foods in the diet is now being validated scientifically. Because dehydrated cereal grass compares favorably with other greens with respect to both nutrients and cost, it is an excellent and convenient source of green food nutrients.