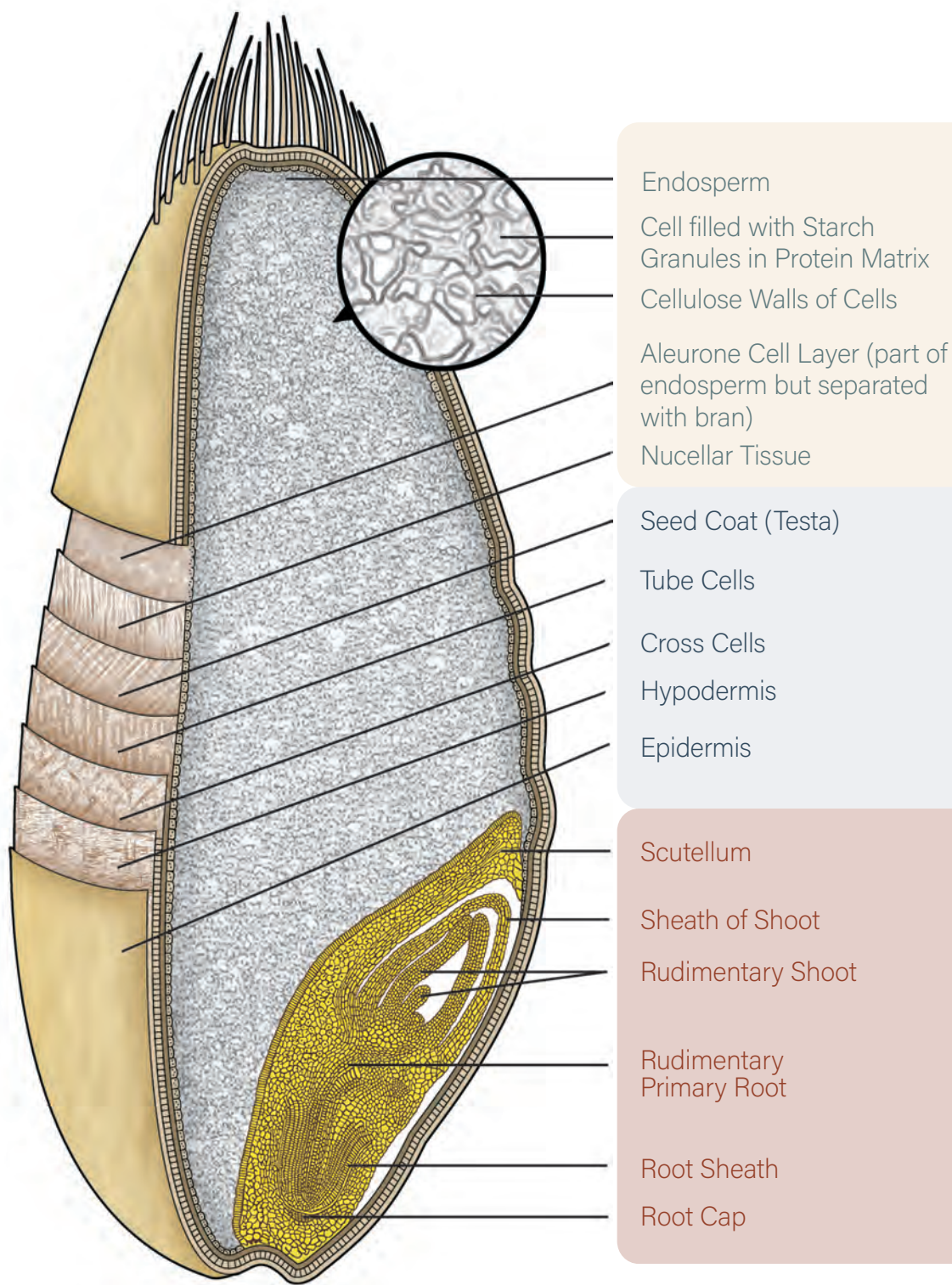


# A Kernel of Wheat

One of the first grains to be domesticated by humans, wheat has long been a staple ingredient in foods consumed around the world. Bread, pasta, noodles, breakfast cereals, pastries, cakes and cookies are just a few of the products made from wheat. It is also used in all types of animal feed.

The wheat kernel, composed of the outer bran layer, the endosperm and the germ, is a storehouse of nutrients necessary in a healthy diet. It is particularly rich in the B-vitamins thiamin, niacin and riboflavin.



*Longitudinal Section of Grain of Wheat*

Many countries fortify wheat flour with micronutrients including iron and folic acid to further enhance the nutritional benefits derived from consuming grain products.

With its many health advantages and end-use applications, wheat remains a popular and important ingredient necessary to achieving optimum nutrition in today's diets. Several countries, including Canada, have identified grain products as a food group essential to healthy eating.

## Endosperm:

The endosperm represents about 83% of the kernel. It is the source of white flour. Of the nutrients available in the whole kernel, the endosperm contains about:

- 70-75% of the protein
- 43% of the pantothenic acid
- 32% of the riboflavin
- 12% of the niacin
- 6% of the pyridoxine
- 3% of the thiamin

Enriched flour products contain added quantities of riboflavin, niacin and thiamin, plus iron and folic acids in amounts equal to or exceeding whole wheat - according to a formula established on the basis of popular needs of these nutrients.

## Bran:

The bran represents about 14.5% of the kernel. It is included in whole wheat flour and is often removed and used in animal or poultry feed. Of the nutrients available in the whole kernel, the bran, in addition to indigestible cellulose material, contains about:

- 86% of the niacin
- 73% of the pyridoxine
- 50% of the pantothenic acid
- 42% of the riboflavin
- 33% of the thiamin
- 19% of the protein

All of these nutrients are also available in animal and poultry feeds. In the human diet, the cellulose material of the bran tends to speed the passage of food through the digestive tract.

## Germ:

The germ represents about 2.5% of the kernel. The embryo, or sprouting section of the seed is usually removed because it contains fat which limits the shelf life of flours. Wheat germ is available separately as human food. It is also added to animal or poultry feed. Of the nutrients in the whole kernel, the germ contains about:

- 64% of the thiamin
- 26% of the riboflavin
- 21% of the pyridoxine
- 8% of the protein
- 7% of the pantothenic acid
- 2% of the niacin