

Layers of the Skin



The skin forms the entire external covering of the body. In terms of surface area and weight, it is one of the largest organs of the body. It performs major functions as follows:

- **Protection.** The skin serves as a barrier that prevents microorganisms and other substances from entering the body.
- **Body Temperature Regulation.** Considerable heat is lost through the skin. Even under conditions of high temperature or exercise, the body temperature remains almost normal.
- **Excretion.** The evaporation of perspiration acts to cool the skin. In addition, small amounts of waste product and salt leave the body through sweat.
- **Sensation.** Nerve endings in the skin provide the body with a great deal of information about the outside environment.
- **Vitamin D Production.** In the presence of sunlight or ultraviolet radiation, a substance in the skin is altered to produce vitamin D₃, necessary for the absorption of calcium and phosphate from food.

The skin has two main layers: the epidermis and the dermis.

The epidermis is the outside layer of cells that serve as a protective shield for the body. It consists of a thin layer of closely packed cells approximately 0.12mm thick. It is considerably thicker in areas subjected to constant pressure or friction such as the soles of the feet or the palms of the hand. The cells of the epidermis only live for about one month, therefore, the epidermis is constantly regenerating itself. The epidermis consists of five layers as follows:

1. **Stratum Corneum (outermost layer).** It consists of varying layers of flat, closely packed, dead cells that are constantly being lost as a result of abrasion -- for example, by friction with clothing. The lost cells are constantly being replaced by cells from deeper layers of the epidermis.
2. **Stratum Lucidum (second layer).** It is a clear band consisting mostly of closely packed cells with indistinct outer boundaries. It is most prominent in areas of thick skin and is absent in some locations.
3. **Stratum Granulosum (third layer).** The cells are flattened and arranged in about three layers. This layer derives its name from the presence of granules in the cells. As the granules grow in size, the nucleus disintegrates and dies, so the outermost cells of this layer are dead.
4. **Stratum Spinosum (fourth layer).** Cells tend to become somewhat flattened. Viewed under a microscope, they appear to have extensions connected to other cells.
5. **Stratum Basale (bottom layer).** Sits directly on top of the dermis. This layer furnishes cells to replace those lost in the upper layers of the epidermis. Melanin is formed here to protect against ultraviolet radiation.

The dermis is positioned just under the stratum basale and is the second main area of the skin. The thickness varies at different locations, but averages approximately 2mm thick. It is well supplied with blood vessels, lymph vessels, and nerves. It also contains specialized glands and sense organs. It has two distinct layers, as follows:

1. **Papillary Layer (top layer).** It contains the projections that form the ridges for fingerprint and footprint patterns. It contains specialized sensory receptors and capillary loops that react to temperature and pressure changes.
2. **Reticular Layer (bottom layer).** It consists of dense fibers that run in various directions. When properly treated, this layer of the dermis in cows become leather.

Reference: Basic Human Anatomy by Alexander P. Spense, Third Edition.