

COATS OF MANY COLORS

Sheep come in many natural colors including white, black, gray, brown, red, and beige. Some breeds are born with darker coats that lighten with age. Some sheep have unique patterns such as spots and freckles. Most sheep are white because they have been bred to be white. This is because white wool can be dyed any color. In natural environments, a dark/brown color is preferred (so the sheep blend into their environment), and there is less variability in color. Small flock owners often want to breed for color. Coat color can be an economic trait for sheep kept for their wool, skins, and/or pelts.



The color of a sheep's coat (and skin) is determined by the genes it inherits from its parents: its DNA. The genetics are quite complicated and vary by breed. In fact, sheep color genetics are still not fully understood. Scientists continue to discover genes and modifiers that play a role in coat/skin color.

It's very complicated!

There are four main genes that control coat color in sheep: Brown/Black (B), Agouti (A), Extension (E), and Spotting (S). B controls the type of pigment produced. Even a "white" sheep is genetically brown or black. A controls the pattern of colored and white fibers. It determines what pigment goes where. A single Agouti gene for tan (white) is very common and the reason why there are so many white sheep. There are many alleles (variations) at the A locus. E is a modifier of the A gene. It determines whether color genes are expressed. You won't get a black sheep without the dominant E gene and white sheep without the wild type E gene. The S gene has two alleles: spotting and no spotting (dominant). There are other genes and/or modifiers responsible for the various spotting variations we observe.

Color in mammals depends on the presence of melanins in skin and hair. Melanins occur as two types. (1) Eumelanin is a black biochemical responsible for black, blue-gray, and chocolate brown. (2) Pheomelanin is a tan biochemical responsible for red, tan, yellow, and off-white. Wool sheep have pale pheomelanin, so red is difficult to achieve as a fleece color. Red wool sheep fade rapidly. Hair sheep can have dark pheomelanin, so dark red sheep are common.