
The Origin and History of Albanism in Bobwhite Quail at the Oklahoma State Game Farm

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Within nature's law governing hereditary factors there is a wide range of variations, some of which are very noticeable and others not so readily apparent to the eye.

Color variations stimulate much interest among breeders of birds and other animals as they strive to develop new strains which are different, and which being unusual will find a ready market. The layman is also inclined to be more interested in color mutations or other unusual color patterns in wildlife than in the regular colorations with which he is familiar.

Albinism is one of the prominent and interesting departures from the normal color of birds and other animals. Many species of animals, including man, have at sometime produced offspring displaying true albinism.

The word *albino* comes from the base word *albus* meaning white, and it refers to individuals of any species which display an absence of pigment in the feathers, fur, skin, nails, claws, eyes and all parts of the body ordinarily showing pigment. Because of this condition the individual is pure white with pink eyes.

Albinism is a recessive factor which breeds true in the pure state and it conforms to a definite genetic behavior which Gregor Mendel, a monk of the middle 19th century discovered. Early work with albinism helped lay foundations for modern studies relating to heredity.

In 1948, on the Oklahoma State Game Farm at El Reno, albino bobwhite quail began to appear in the regular hatches. These birds could have been the progeny of any one of the 4,200 pair of breeders. It was

impossible to determine which of the parents of this chance mating was carrying albinistic genes and producing the white, pink-eyed novelties. During the season of 1948, twenty-seven albino young were hatched on the farm. Of these only four were reared to maturity, one of which died before the following spring. The remaining birds were two cocks and one hen. In the following years one of the cocks and the hen were paired and they produced fertile eggs yearly for four years. Although fertile, few eggs hatched and those hatching did not survive. Most of the chicks died during the first four days. One lived four weeks. During the early laying season of 1953, the albino pair laid thirty-two eggs of which fourteen albinos hatched, all of which subsequently died. The 1953 season was the only year in which a production record was kept.

After laying one fertile egg in the spring of 1954, the hen died at the age of five years. The cock died also about a month later. These birds became very inactive during the last year and very often had to be removed from the cage and have the droppings cleaned from their under tail coverts. Death came as the result of old age. The birds were not preserved because of their poor condition of plumage.

In the laying season of 1953, the remaining albino cock was paired with a normal colored bobwhite hen and twenty-one F1 normal-colored young were raised to maturity from sixty-seven eggs set. These F1 generation birds were all normal-colored but carried the albinistic factor.

In 1954, one of the F1 generation females was back-crossed to the albino cock (8 years old). This mating produced thirty-nine eggs from which nineteen F2 offspring were hatched producing eleven normal-colored as compared to eight albinos. This approaches the 1:1 ratio expected from such a cross, in which a heterozygous individual is back-crossed to an homozygous recessive.

In the season of 1954, nine pairs of the F1 generation, from the albino X normal-colored mating, produced two hundred twenty-one F2 offspring from 401 eggs set. Of these one hundred seventy-eight were normal-colored and forty-three albino. This approaches the 3:1 ratio discovered by Mendel and indicates a simple recessive type of inheritance. Five of the forty-three albinos produced were raised to maturity. One flew into the side of the cage resulting in its death. Of those surviving, two were cocks and two were hens. Inbreeding does not necessarily lead to the appearance of albinism. Once this factor appears however, inbreeding can be used to maintain the strain as has been done at the Oklahoma State Game Farm.

During the 1955 season, the four 1954 albino bobwhites were left in a group, from which twenty-one eggs were produced. All of these were fertile. The old original, now seven years old, cock was not given a mate, but his actions indicated that he was still sexually stimulated. He continued to call "bobwhite" and to answer when female quail called.

Some of the characteristics of true albino quail are interesting and help to explain their inability to survive in the wild. All of the albino quail hatched at the Oklahoma Farm have shown an extreme weakness of the eyes, which appears to be associated with mortality. Since quail are precocial and depend entirely upon their individual ability to see clearly their food, true albinos are handicapped from the very beginning. Altricial birds and animals which depend almost entirely upon the mother during their early development have a much better chance of survival in the pure albino state. Nocturnal albino birds and other animals may survive more successfully than diurnal ones because the eye is not damaged by intense sunlight.

All of the albino bobwhites produced in the experiment have evidence of eye weakness from birth. They held the body and the neck erect, and swayed slowly from side to side presumably in an effort to focus the eye

on a point of interest. In feeding and watering, they exhibited a tendency more or less to gulp when taking food. No exact picking of the feed as in normal quail was noted. They were forced to feel about the cage haphazardly to find food and water. Perhaps those surviving were the ones most successful in feeling their way to food and water.

Total blindness develops in about a year. As it approaches, the individual shows such signs of discomfort as holding the head sideways presumably in an effort to see. It may be hesitant in moving about and may tend to spend much time in a brooding position. When touched it may jump or attempt to fly.

The old cock, which is now in his eighth year, moves about with ease never attempting to fly. The left eye has atrophied while the right one has become cloudy, unnatural and sightless. His nails and upper bill have grown long from lack of use, and regular trimming of these is required. Even in this sightless condition it was found that exposure to artificial light, lengthening the day to 14 hrs. during the winter months stimulated this bird sexually causing him to call "bobwhite" and show other signs of the mating urge.

From a practical standpoint, albino bobwhites are of no particular value. People show much interest, however, in the unusual birds. A regular inquiry when visitors arrive at the farm is "Do you still have the albino bobwhite?"