CA 44-61
August 1965

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Animal Husbandry Research Division
Beltsville, Maryland

BREED HISTORY AND COMMERCIAL PRODUCTION OF THE BELTSVILLE SMALL WHITE TURKEY

The Beltsville Small White turkey is a distinct variety frequently referred to as a breed -- its separate status determined primarily by its relatively small size. It is broad-breasted in conformation and has, in all respects, the same color as all other white-plumaged turkeys. It is no different from other turkey varieties in livability, in susceptibility to disease, and in requirements for feeding and management.

The Beltsville Small White turkey is the product of an experiment, started in 1934, in the pedigree breeding of turkeys toward definite objectives which, at that time, were: small size, toms averaging 14-1/2 pounds alive at market age of about 24 weeks, hens 8-3/4 pounds; quick market maturity, birds of both sexes in U.S. grade A condition at 24 weeks; a compact body with moderately long keel bone and heavily muscled, especially on breast and legs; moderately short neck and legs; good livability; good egg production; high fertility; high hatchability; and freedom from heritable defects. These objectives were largely attained by 1942 and were exceeded in later years when body type was improved -- weights at 24 weeks averaged 16 pounds for males and 9 for females, and breeder weights at 34 weeks of age averaged 11-1/2 pounds for hens and 21 pounds for toms.

Trapnesting of the hens and individual pedigreeing of the poults were employed to obtain information on egg production, fertility, hatchability, broodiness, and livability. Detailed physical observations were made at 24 weeks of age covering the following characteristics: state of feathering, fat in the skin, breast fleshing, leg fleshing, length of shank, length and shape of keel, depth of body from point of keel vertically to the back, body weight, body balance, and presence of abnormalities or deformities. The first two factors (feathering and finish) determined the market maturity, and the first four (feathering, finish, breast fleshing, and leg fleshing) determined the market quality. Numerical systems were devised for classifying the variations in these four factors as determined with sliding-jaw calipers. From the trapnest and incubation records, the egg production, egg-shell quality, egg weight, fertility, hatchability, and broodiness of each hen were determined. From the rearing records, the growth rate, livability, and production of defects in each hen-family were determined. From the 24-week observations, hen-family averages of the factors relating to market grade and the measurements were compiled. From a combination of performance and progeny-quality records, selections were made each season. The best individuals from the best families were used, that is, those families that came nearest to meeting the breeding objectives and those free from tendencies to produce defects, such as pendulous crops, split wings, and perosis.

In 1934, hatching eggs were purchased from one breeder of Narragansetts, two breeders of "Baby Beef" Bronze, four breeders of White Hollands, and one of wild turkeys. These strains were combined in two single-male matings in 1935 and in four F_1 matings and one backcross mating in 1936. In 1936 and 1937, additional hatching eggs were obtained from two breeders of wild turkeys, one of Canadian small-type Bronze (Charlevoix) turkeys, one of Black turkeys, and two other breeders of White Hollands. In the fall of 1936, eleven small-type White Austrian turkeys were imported from Scotland. Twelve single-male pens made up of various combinations of these strains and varieties were used in 1937 and seven in 1938.

In 1939, seven single-male matings were made, arranged in such a manner as to establish four separate family lines. This was accomplished in subsequent years by maintaining each of three lines in two single-male matings and one line as one single-male mating. In the two-pen lines, the progeny were crossed reciprocally each year (a male from one with females from the other). Mostly young hens were used each year, but a few of the best performing hens were retained in their original pens for one or two additional breeding seasons. In the remaining single-pen line, young hens were used each year while the tom was a holdover yearling, a son of the best performing hen of the previous year's mating. This plan of breeding was carried out through 1942, using 20 to 22 hens and 1 tom per pen.

In 1941, three of the smallest available Broad-Breasted Bronze young hens of typical conformation from a well-known Oregon strain, weighing approximately 13 pounds each at 24 weeks of age, were added to the family line that consisted of one pen. In 1942 this line was made up entirely of the heterozygous bronze-colored progeny from this cross. In 1943, the four lines were crossed, the matings were increased to 8, and the Small White X Broad-Breasted Bronze progeny were introduced into all but one of the matings to improve the market type to full broad-breasted conformation and to increase the size to 16 pounds for toms and 9 pounds for hens at 24 weeks of age. In 1944, four matings were made and in 1945, five matings. Starting with 1945, and again using only the white-plumaged birds, a circular or rotation mating system was started, using five to seven matings of one male and about 22 females each. The females consisted of a few of the best performing old hens and the selected young progeny of all hens that performed in a highly satisfactory manner. Each season the selected females were returned to the pens of origin but the selected young male was moved over one pen to the right. To complete the circle, the male from the last pen of the series was moved into the first pen. Due to differences in performance and in environmental factors, this system could not be followed exactly, some lines being expanded while others were curtailed or eliminated. In general, however, the circular mating plan was followed. Each year since 1936, 500 to 1,000 young birds have been available for the selection of breeding stock.

From 1935 through 1942, incandescent white light from 4 a.m. until 9 a.m. starting January 15 was supplied at an average of about 2 foot-candles at bird height. For the 1943 seasons and each year thereafter, the 4 a.m. lighting was started in December of the preceding year and maintained until June 21 or later. Throughout the experiment, all-mash breeder diets of essentially the same basic composition were fed, with some necessary changes due to shortage of ingredients during the war and post-war period, 1943-48. After 1948, some changes were made to take advantage of the findings of nutritional research. Through 1961, during the breeding season, access to grassed yards was provided, after which the breeders were confined to well-ventilated frame buildings.

Simultaneously with the commercial development of the Beltsville Small White turkey came the idea of marketing these small white turkeys in an immature state as "broilers" -- a term which is inappropriate since they almost never were broiled and seldom were fried. Nearly all were roasted and they were classified as fryer-roasters under the U.S. grading system for dressed turkeys. In view of this new use for the small turkey, the breeding work has, since 1950, included objectives relating to this use. These objectives were fast early growth resulting in males averaging alive 9-1/2 pounds and females 6-1/2 pounds at 16 weeks of age along with smooth, plump appearance and a finish equal to the U.S. grade A specifications for fryer-roasters. In 1964, it was reported that 79 percent of the 11,500,000 "light breed" turkeys raised in the United States were marketed as fryer-roasters at about 16 weeks of age and 21 percent of the 38,900,000 heavy white turkeys marketed at 11 to 13 weeks of age. Fryer-roasters derived from these young heavy-type turkeys, especially the males, tend to be less attractive than those derived from Beltsville Small White stock. However, the age when marketed and the breed of origin seldom can be determined by the consumer since this information usually is not given on the frozen turkey package, nor is it available to the seller.

The Beltsville Small White turkey was favorably received by the turkey industry and was admitted to the American Standard of Perfection as a new variety in 1951. Commercial production of Beltsville Small White turkeys, from a small beginning in 1947, increased to an estimated 28 percent, or about 19,000,000 of the 67,693,000 turkeys produced in 1954. After 1954, the numbers declined to an estimated 17 percent, or about 13,000,000 of the 76,741,000 turkeys raised in 1956 down to approximately 12 percent, or about 10,000,000 of the 84,724,000 turkeys raised in 1960, and 9-1/2 percent or about 9,000,000 of the 93,370,000 turkeys raised in 1963. This decline was due to the widespread use of the large white strains as fryer-roasters. In 1964, the production of "light breed" turkeys increased slightly to 11-1/2 percent, or about 11,515,000 of the 99,537,000 produced, according to preliminary estimates by the U.S. Department of Agriculture, Crop Reporting Board, Washington, D.C. (POU 3-1, 1965). Of the turkeys classified as "light breeds," nearly all are presumed to be Beltsville Whites or of that breeding.

In recent years most commercial breeders of Beltsville Small White turkeys have increased the size, mainly through selection, so that the modern commercial Beltsville, or "light breed" turkey is somewhat larger than the original stock, averaging about 9 pounds (alive) for both sexes at 16 weeks of age, 12 to 14 pounds for hens, 23 to 26 pounds for toms, at 34 weeks of age.

In 1941 and 1942, the first hatching eggs of the new white strain were released to interested Colleges of Agriculture and State experiment stations which resulted in some distribution to private breeders. During 1945 through 1960, hatching eggs and poults were sold directly to private breeders as well as State and Government agencies. From 1941 through June of 1962, hatching eggs and poults in excess of 60,000 were sold to breeders in the United States, Canada, Mexico, and certain countries of South America, Europe, Asia, and Africa. After July 1, 1962, distribution was limited to experiment stations and State or Government agencies.