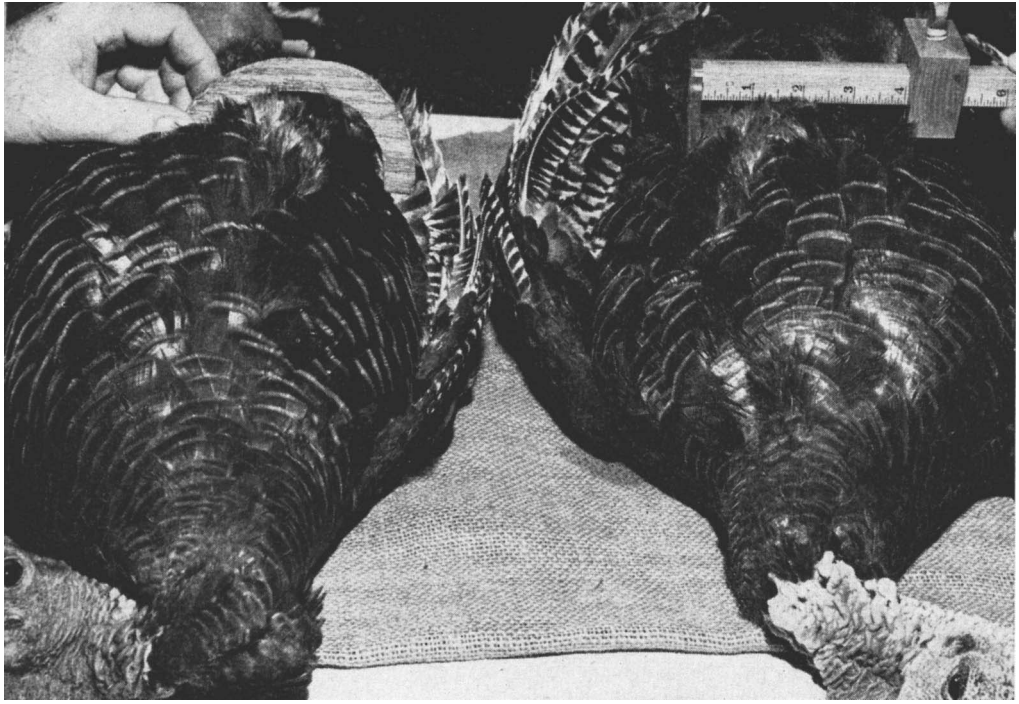
Turkeys

recent research in breeding, use of lights, handling of hatching eggs, and in feeding

V. S. Asmundson



Measuring width of breast to determine whether it meets standard of 3½ inches. Measuring device at left has 3½-inch inside diameter. Both measures are types in common use among growers.

RESULTS OF several years of experiments in making crosses between broadbreasted and other strains of Bronze turkeys have demonstrated that the differences in weight, width of breast, and other characters are inherited and the indications are that there is a high degree of heritability.

Stated in a different way, selection to increase weight and width of breast should result in fairly rapid improvement.

In this case the larger birds tend to have wider breasts although width of breast is not controlled entirely by the same hereditary factors as weight or size of bird. It is entirely possible to increase width of breast without increasing weight of birds. Selection for increased breast width is likely to result in increased weight unless a maximum weight is set for birds used for breeding.

Selecting Breeding Turkeys

Shank length is related to weight in much the same way as width of breast—the larger birds tend to have longer shanks. Shank length is apparently controlled to a greater degree than breast width by general size factors.

Selection for short shank is likely to result in the selection for breeding of the smaller birds, and selection for shorter shank would be canceled by selection for greater weight. It may also be recalled that larger birds have relatively shorter—though actually longer—shanks than smaller birds.

One of the sublethal genes found in turkeys causes a slight shortening of the legs in the heterozygote—a bird with a single dose of this particular gene—the birds that are homozygous or true breeding for this "short" gene are abnormally short-legged and most of them die in the shell or soon after hatching.

The results of this research have prompted us to recommend that the breeder pay no attention to length of leg except to make certain that the birds have normal legs, free from deformities such as perosis, and that they walk normally.

Selection should be concentrated on weight—avoiding extremely heavy males—and on breast conformation, emphasizing reasonable width of breast together with length of keel.

Since width of breast and length of keel are negatively correlated, neither should be overemphasized nor neglected.

Some selection for width and smoothness of back is desirable, but for the most part our results indicate that selection other than for weight and breast conformation may best be aimed at eliminating birds with abnormalities.

Use of Lights for Turkeys

This work, which has been in progress for some years, is still far from complete.

Several conclusions or tentative conclusions may be mentioned:

1. Bright lights, having an intensity of two foot candles where the birds roost, are required to bring hens into egg production.

2. Seven- to 7½-months-old hens come into production in about four to five weeks.

3. About a 14-hour "day" of artificial and natural light is best.

Birds given all-night lights come into production fast but in our tests have not laid quite so well later. Otherwise too, results from such birds have not always been satisfactory, hence the use of all-night lights is not recommended until more information is available.

When turkey hens are brought into production at too early an age, they lay too many small eggs. For that reason bright lights, if used for growing turkeys, should be so placed that they do not shine on the roosts or directly on young hens when five to seven months old.

The lights used to bring hens into production may be regularly spaced 20 to 30 feet apart or flood lights may be used to light the area occupied by the roosts.

Failure of a flock of birds to respond usually means that the birds are not exposed to sufficiently bright light or are exposed for too short a time. This in turn may be due to the birds' roosting outside the brightly lighted area or to very dark, foggy weather which, in effect, shortens the "day."

Lights should not be turned on turkey breeders too soon; allow about four weeks if eggs are wanted by January 1st when the birds are about eight months old, three weeks if wanted by February 1st. Eggs laid before there is a demand for them are wasted.

Studies at Davis indicate that one of the causes of early season infertility is the use of immature males. If the birds are about eight months old when they start laying, there should be no serious difficulty with this problem.

Handling the Hatching Eggs

Recently we have coöperated with the California Turkey Growers Association, and also made some tests at Davis to determine the effect of aging, holding temperatures, dirt, and washing prior to incubation on hatchability.

The results indicate that hatchability sometimes begins to decrease about the fifth day and that it goes down about 1% per day after the first week. The results of the temperature studies are less clear cut but indicate that effective cooling is desirable. Washed dirty eggs did not

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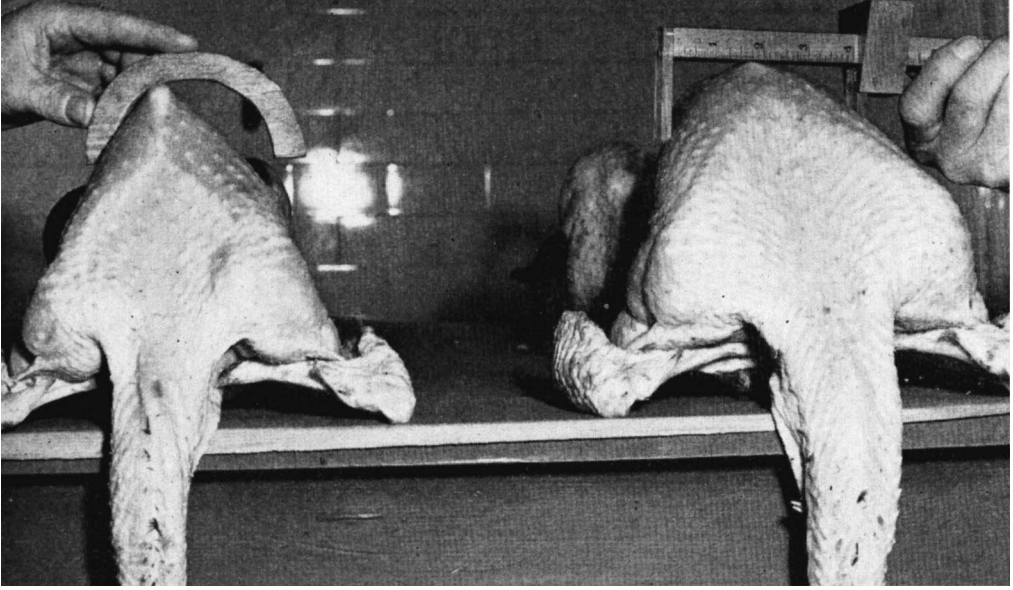

Measuring width of breast on dressed birds.

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hatch well, whereas washed clean eggs hatched as well or almost as well as unwashed eggs.

These findings emphasize the importance of producing clean eggs; keeping them in a cool room on the farm, at the receiving plant, and in transit; frequent delivery to the receiving plant or hatchery—two or three times a week—and prompt shipment from the receiving plant to the hatchery. Of course, the hatchery operator should also set the eggs promptly after they are received.

Turkey Feeding

Hatchability of turkey eggs is determined primarily by the hatching quality of the egg when laid. Methods of handling and hatching the eggs can reduce the innate hatchability of the new laid egg but cannot do much, if anything, to improve it. This is determined by breeding and by nutrition. In practice nutritional deficiencies are probably more commonly responsible for hatching failures than are breeding effects, such as those resulting from close inbreeding.

Knowledge of the nutritional requirements of turkeys to ensure maximum hatchability is still incomplete. Work done some years ago showed the need for riboflavin and pyridoxine and this has been well established.

Since the needs for reproduction have not been fully established, it would be well to feed an adequate breeder ration starting about a month before eggs are expected. If lights are used, the change to a breeder mash might be made at the time the lights are started. Then as an added insurance measure fresh greens should be fed.

The turkey nutrition work has demonstrated that turkey poults require a slightly higher level of the water soluble vitamins, such as riboflavin, than chicks. Also that the higher protein requirements of turkey poults as compared with chicks are reflected in higher requirements for some of the indispensable amino acids—the building blocks of the proteins. Too low a level of lysine may or may not be the cause of the wide white bar sometimes seen on the wings of Bronze poults, but in any case the work done on protein requirements indicates that too little protein is the commonest cause of the white bar and the slow growth which often is associated with it.

While much work remains undone on the nutritional needs of young turkeys, it is expected that work can soon be started on the nutritional needs of breeding turkeys.

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HEALTH CONCEPTS

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Such widely prevalent conditions as anemias may be of varied origin involving iron, copper, cobalt, and members of the B complex.

In the human, macrocytic anemia may be due to improper diet lacking meat, milk, and eggs, resulting in an absence of the extrinsic factor, and be nutritional in origin. Folic acid may be involved. This is usually the case in sprue and other tropical macrocytic anemias.

No data on nutrition, as a factor in resistance of humans to infectious disease, have been obtained in any way comparable to known data on inherited resistance in poultry, where fowl typhoid has been reduced from 85% to 10% in five generations of selective breeding.

The situation with diseases caused by protozoa is quite comparable to infectious disease in that data are lacking, inconclusive, or in some cases, quite negative.

In the case of parasitic invasions the importance of nutrition has been more tangibly established. Thus in cecal coccidiosis of growing chickens caused by *Eimeria tenella* the feeding of a ration containing 40% dry skim milk has been demonstrated to be beneficial. Credit for this has been given to the milk sugar, to the nutritional value of milk and/or the laxative effect.

Nutrition, heredity, and disease are so closely interwoven in the development and environment of the individual that separation for even carefully controlled experiments is extremely difficult or impossible.

While great progress has been made, we now need to know the secrets that remain unknown.

George H. Hart is Professor of Animal Husbandry, and Animal Husbandman in the Experiment Station, Davis.

Factors involved in the yield of olive orchards are subjects of a special study undertaken by the Division of Pomology.

CALIFORNIA AGRICULTURE this month comes to you in new form, one that we hope will not only be more attractive but also will enable us to give you more information. The response to this publication has been gratifying; we believe it is serving a useful purpose in getting results of research in the College of Agriculture to you more quickly. We will welcome suggestions for its further improvement.

—THE EDITOR