A FORCED-AIR SYSTEM FOR POULTRY HOUSE VENTILATION[1]

By
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Beginning in 1945 three identical poultry house units were set up and equipped each with a different type of ventilating system. A muslin-front system, a slot system and a forced-air system were used. All units had loose-fill insulation in the walls and ceilings. The houses were 18 ft. by 18 ft. in size with shed roofs. Seventy-five single comb White Leghorn pullets were used in each pen. All birds received the same ration. Recognized practices of good husbandry were used.

Data were taken on temperature, air flow, egg production, mortality, feed consumption, body weight and egg hatchability.

The first year's results indicated the following:

1. A thermostat is essential on a forced-air ventilating system to prevent the temperature from becoming excessively low during cold weather.

2. The fan capacity should be at least 1 cu. ft. per minute per bird during mild weather.

3. Egg production during the 24-week test period was 42.6 per cent in the muslin-front pen, 46.5 in the slot-system pen, and 48.4 per cent in the forced-air ventilation pen.

4. Mortality was about the same in all pens.

5. Egg hatchability was satisfactory in each pen.

6. The gain in body weight was approximately the same in each pen.

In 1946 a new 20 ft. by 20 ft. poultry house with gable roof was constructed in which were incorporated some of the ideas gained from the previous year's work. A forced-air ventilating system was used. Figure 1 shows the principle of this system. During 1946-47 data were recorded in this unit and in the three units previously used.

A 9-inch blade type fan (A) with a 1/20 H. P. motor was used to force air into the house shown in Figure 1. The air enters from the attic through an opening in the ceiling. Louvers (B) are provided at each end of the attic to permit air to enter. A baffle board (C) at the ceiling spreads the incoming air in all directions and prevents the incoming air from coming in direct contact with the birds on the floor or roosts. A thermostat (D) with a one-degree

[1] Progress report on Bankhead-Jones, Project 34, Forced Air for Ventilating Systems for Poultry Houses compared to the Muslin Front and Slot Systems.
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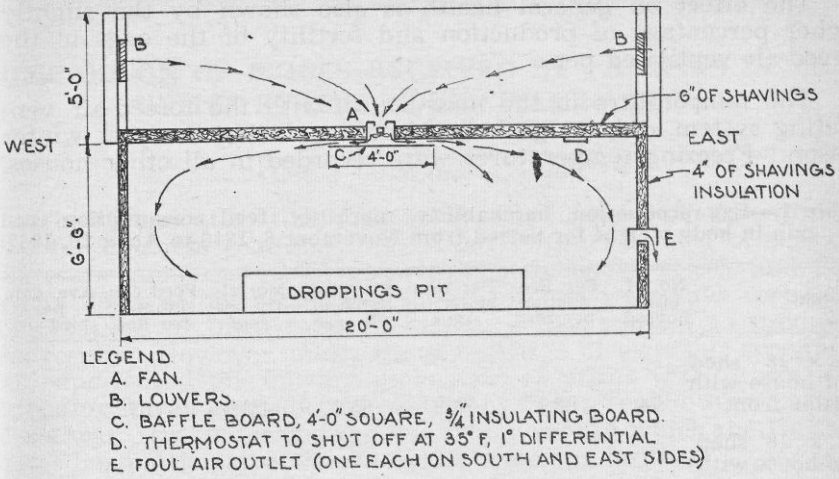

Figure 1. Forced-air ventilating system for poultry house.

differential was used to shut off the fan when the temperature in the house went down to 35°F. or below. The thermostat is located at the ceiling about 7 feet from the fan. During extremely cold weather when the thermostat had shut off the fan, the warm air rose and in about 15 to 20 minutes the ceiling temperature was sufficiently high to cause the thermostat to again turn on the fan. The thermostat keeps turning the fan off and on at about 15 to 20 minute intervals, until outside weather conditions are such that the inside temperature of the house remains above 35°F. The fan runs continuously when the inside temperature is above 35°F. Foul air is exhausted by two 4 inch by 8 inch openings, one on the east and one on the south side.

All four poultry houses used each had six windows. Each window is a 4-light 9" x 12" sash. The east, south, and west sides each have two windows. Storm windows are used during the winter months.

All windows and doors are kept closed while the fan is in operation. In the spring when outside temperatures are higher, all windows are opened and the use of the fan is discontinued. When operating continuously, the fan uses about 1 K. W. hour of electricity per 24-hour day. The cost of operating the fan per month is from $0.60 to $1.00.

Data collected during the second (1946-47) season are given in Table I.

The greatest difference is in mortality. The forced-air ventilated pens showed a much lower mortality. This is probably due to the fact that no floor drafts occurred in the fan-ventilated houses. In the natural draft ventilated houses the air movement on the floor was measurable and often exceeded 50 feet per minute.

The effect on general health is also shown by the slightly higher percentage of production and fertility of the eggs in the forced-air ventilated pens.

The temperature in the new house, with the forced-air ventilating system, did not go below freezing during the past winter season. Freezing temperatures were recorded in all other houses.

Table 1.—Egg production, hatchability, mortality, feed consumption, and gain in body weight for period from November 6, 1946 to April 29, 1947.

House	No. of birds housed	Egg Production per bird	Per cent of fertile eggs	Per cent hatch of all eggs	Mortality per cent	Feed consumption per doz.	Ave. gain per bird lbs.
18′ x 18′ shed roof house with muslin front	74	88.1	78.3	65.8	12.2	5.67	0.27
18′ x 18′ shed roof house with slot system	72	90.6	71.7	62.3	19.4	5.45	0.28
18′ x 18′ shed roof house with forced-air system	75	92.8	81.5	68.6	9.3	5.47	0.38
20′ x 20′ gable roof house with forced-air system	99	95.8	81.1	71.9	10.1	5.72	0.24

COMPARISON OF PRICES RECEIVED BY FARMERS IN THE UNITED STATES WORLD WAR I AND II

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The statement that history repeats itself does not hold entirely true for business conditions, and for the general level of prices. There are numerous factors which affect business, prices, and the general level of business activity, and rarely do we have repeated combinations of these same factors in a like manner to produce like results. However, under the stimulation of wars our economy has experienced the upward movement of prices with prosperity extending for an unpredictable length of time after the termination of the war. By comparing the two latest wars in which the United States has participated we can notice some similarities.

Figure 1 shows the comparisons of prices received by farmers for two periods, World War I and II. Based on index numbers using the years 1910-1914 as a base, we see that their rise was quite similar. There was a tendency in 1943, 1944, and 1945, for prices to level off, but after the removal of OPA controls, prices of farm products sky-rocketed.

When these prices are converted to purchasing power as shown in Figure 2, we see a similar pattern but this more accurately measures the farmer's income and general prosperity. In both wars the farmers enjoyed a favorable position, which is always true when prices are rising. Prices of basic commodities, such as steels, ores, coal, and agricultural products, are more sensitive to supply and demand and thus rise or fall most rapidly. Prices of processed and manufactured goods lag behind the prices of basic commodities; this lag is due chiefly to manufacturing and processing labor costs or wages, which are less flexible. In general, the farmer is in a favorable position during periods of rising prices and in an unfavorable position during periods of falling prices.

When we consider prices farmers received as shown in Figure 1, we see that the rise was quite similar during the two war periods, but to date this comparison shows no real indications that prices will fall off. During the period 1943 to 1945, we see a leveling of farm prices as well as purchasing power due to price control regulations. 1946 was a very favorable year for farmers in the United States from the standpoint of prices received in comparison to prices paid, that is purchasing power. The preliminary 1947 figures would indicate that the purchasing power may take a slight downward trend, especially if the price of commodities farmers buy continues to increase.

While there are no definite indications that farm prices will decline, there seems to be some evidence that the farmer's purchasing power may be on the decline. Without price supports, the prices