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# *Parametrs microclimate in poultry house*

***The article presents the performance of the microclimate in different areas of the poultry house when the content of laying hens in battery cages. It was found that the parameters indoor climate in the poultry house meet regulatory requirements***

*Poultry house, battery cages , temperature of air, relative humidity, the speed of air movement, concentration of ammonia*

Efficient management of poultry depends on many factors, one of which is the improvement of industrial technology of laying hens by optimizing the air environment in a typical windowless houses [1,4].

T.A.Stollar [8], V.A.Ivanenko [3] consider that not always given due attention to the problem of optimizing the air mode poultry houses, which has a significant impact on productivity in poultry and economic efficiency of poultry.

In this regard, N. In. Pigarev [6], V. M.Peasant [7], A.K.Danilov [2] point to the need to perform deep enough research to study the effects of different air pollution on the physiological state and productive performance of laying hens in battery cages in the industrial production of eggs in large windowless buildings.

The climate in the housing must meet the physiological condition of hens, their age, level of performance. According to some researchers found that the optimal room temperature for cellular hens should be 15-16 ˚C at humidity of 60-70%. Undesirable temperature fluctuations in the direction of increase and decrease, since this temperature regime has a negative impact on the productivity of poultry [9, 11,12].

However, for new highly productive breeds and crosses chickens need some clarification on temperature and humidity conditions, the concentration of harmful gases in the air and other parameters of the microclimate, according to the biology of birds [5].

The purpose of the research. To determine the parameters of the microclimate in different zones of the house when the content of laying hens in battery cages.

The test was conducted in poultry farms "Avis" Luhansk region.

*Microclimate parameters were determined:*

- humidity with a psychomotor of Assman;
- the air temperature at the level of each tier of the battery (in the center of the cell) using a mercury thermometer;
- the velocity of the air in the room using the anemometer and katathermometer; the ammonia content in the air of the house with the help of technometrica methods and analyzer.

The research results. Studies of microclimate indicate uneven distribution of its parameters depending on the area of the house *(table)*. Regarding the dynamics of air regime in separate areas of the house, they had certain laws, including the temperature of the air .

Thus, the air temperature (the standard 18-16 ˚C) ranged from 15,2 ˚C to 18,7 ˚C. The most elevated air temperature was observed in the center of the house: on the top tier – 17,0 ˚C, on average – 18,0 ˚C, and the bottom of 18,7 ˚C. On the angles of the house, it was inferior to the norm, and in all tiers cell batteries was 15,2-15,8 per ˚C. The area of the second and fifth rows cell battery indicator temperature approaching normative data: the top tier is 16,8 ˚C, at an average of 17,0 ˚C, and the bottom of 17,4 ˚C. In the whole house level temperature regime was within the normal range of 16,8 ˚C.

In relation to relative humidity, also noted that the center of the house at all tiers cell batteries exceeded this figure and was 72,0-73,1 per cent against the norms of 60-70%. In the corners of the house relative humidity was slightly changed from the norm: on the top tier consisted of 58,0%, on average, and 58,2%, and the lower – 58,2%. The relative humidity of the second and fifth rows cell batteries, were in the normal range on all tiers cell batteries and amounted to 64,2-64,8 per cent. In addition, relative humidity average house corresponded to the ratio of 67,7% vs. 60-70%.

The most variable is the air velocity. It changed from was 0,138 (on average) in the center of the house to 0,338 m/s in the corner and 0,343 m/s on the second and fifth rows cell batteries. Best performance for air velocities observed in the zone of the second and fifth rows cell batteries, which corresponded to normal (0,3-0,4 m/s). Thus, in this zone on the top tier cell batteries air velocity amounted 0,342 km/h, on average – 0,338 m/s and lower – 0,348 km/h. Consequently, the dynamics of air speed depends primarily on the area of laying hens in battery cages.

It is noticeable that, depending on the area of the house changed the ammonia concentration of 3,3 mg/m$^3$ in the corner of the house on the upper and the middle tier, and 15,0 mg/m$^3$ in the center of the house on the lower tier. In the area of the second and fifth rows cell batteries, the ammonia concentration was 8,2 to 8,4 mg/m$^3$, there was at the level of the norm (up to 15 mg/m$^3$). Concentration of ammonia in the house, she was under the norm of 8,4 mg/m$^3$ 15 mg/m$^3$.

**Conclusions:**

1. The best air environment conditions specified in the zone of the second and fifth rows cell batteries.

2. The parameters of the microclimate in the center of the house and in

*The microclimate in different areas of the house*

| Area the poultry house | Microclimate parameters | | | |
|---|---|---|---|---|
| | temperature of air, ˚C | relative humidity, % | the speed of air movement, m/s | concentration of ammonia, mg/mi |
| **The center in the poultry house:** | | | | |
| the upper tier | 17,0±0,2 | 73,0±1,0 | 0,211±0,002 | 11,7±0,2 |
| seredni tier | 18,0±0,4 | 72.0±0,7 | 0,10±0,000 | 12,7±0,2 |
| the lower tier | 18,7±0,2 | 73.1,0±0,6 | 0,103±0,000 | 15,0±0,3 |
| On average | 17,9±0,2 | 72,7±1,4 | 0,138±0,003 | 13,1±0,5 |
| **Corners:** | | | | |
| the upper tier | 15,2±0,2 | 58,0±0,6 | 0,411±0,008 | 3,3±0,6 |
| seredni tier | 15,4±0,2 | 58,2±0,4 | 0,406±0,024 | 3,3±0,6 |
| the lower tier | 15,8±0,2 | 58,2±0,4 | 0,194±0,027 | 5,3±0,6 |
| On average | 15,5±0,2 | 58,1±0,7 | 0,338±0,038 | 4,0±1,3 |
| **The second and fifth rows cell batteries:** | | | | |
| the upper tier | 16,8±0,0 | 64,2±0,2 | 0,342±0,014 | 8,2±0,4 |
| seredni tier | 17,0±0,2 | 64,4±0,4 | 0,338±0,160 | 8,4±0,6 |
| the lower tier | 17,4±0,2 | 64,8±0,4 | 0,348±0,008 | 8,2±0,4 |
| On average | 17,1±0,3 | 64,5±0,6 | 0,343±0,180 | 8,3±0,9 |
| On average throughout the poultry house | 16,8±3,4 | 67,7±9,6 | 0,273±0,342 | 8,4±6,2 |

the corner some improvement compared to the norm.

3. The latter defined the parameters of the microclimate of the house poultry normative.

***В статье приведены показатели микроклимата в разных зонах птичника при содержании кур в клеточных батареях.***

*Птичник, клеточные батареи, температура воздуха, относительная влажность воздуха, скорость движения воздуха, концентрация аммиака*

***Установлено, что параметры микроклимата в птичнике отвечают нормативным требованиям.***

***У статті наведені дані показників мікроклімату в різних зонах пташника при утриманні курей в кліткових батареях. Встановлено, що загалом параметри мікроклімату по пташнику відповідають вимогам.***

*Пташник, кліткові батареї, температура повітря, відносна вологість повітря, швидкість руху повітря, концентрація аміаку.*

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