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Analysis of Cattle Housing Conditions

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Annotation: *This article analyzes the zoohygienic conditions in cattle housing facilities (barns), particularly focusing on microclimatic indicators such as temperature, relative humidity, air movement speed, concentrations of harmful gases (carbon dioxide, ammonia, hydrogen sulfide), and the level of illumination. Detailed information is provided on the methods, instruments, and measurement points used to determine the microclimate. In addition, normative indicators established for housing cattle of different ages and types are compared and studied. According to the research results, it is emphasized that strict adherence to zoohygienic requirements in barns is essential to ensure the health and productivity of animals.*

Keywords: *Cattle, barn, zoohygiene, microclimate, temperature, humidity, air movement, harmful gases, illumination, gas analyzer, lux meter, ventilation.*

To determine the overall zoohygienic condition of a farm, several key factors are considered: the state of the barn floor, stalls, boxes, and doors; the structure and efficiency of the ventilation system and gas exchange; heating and sewage systems; manure storage and removal; lighting; animal housing technology; feeding systems; and daily routines. The temperature, relative humidity, and concentrations of gases such as ammonia, hydrogen sulfide, and others in the air are determined.

The barn microclimate is assessed once a month over three consecutive days (before work, during the day, and after work in the evening). The results of the measurements are recorded in special journals and compared with standard indicators.

Each microclimatic indicator is monitored at specific points within the barn, particularly at three locations along the diagonal: at the entrance, 1–3 meters from the wall, and in the center of the barn.

Along the barn's vertical axis, measurements are taken at five points:

1-At a distance of 0.60 m from the ceiling (for all barns);

2-At 30 cm above the stall floor (for calf barns);

3-At 70 cm above the stall floor (for calf barns);

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4-At 60 cm above the floor (for adult cattle barns);

5-At 120 cm above the floor (for adult cattle barns).

The air temperature in the barn is measured using mercury or alcohol thermometers, electronic thermometers, or thermo-anemometers. The duration of temperature measurement at each point should not be less than 10 minutes. Continuous temperature monitoring during the day or week is carried out using self-recording thermographs.

The air movement speed is determined using anemometers or kata-thermometers. Cup anemometers (MS-13 model) and vane anemometers (ASO-3 model) are used to measure air movement in ventilation ducts. For low-speed airflows (below 1 m/s), kata-thermometers are applied.

Air humidity is determined using static (August) and aspirated (Assmann) psychrometers, as well as hygrometers. Continuous recording and control of air humidity are performed using hygrographs. With the M-IA model hygrograph, air humidity ranging from 30% to 100% can be measured over a day or a week at air temperatures of 35–45°C.

Microclimate indicators in cattle housing barns

Molxona turi	**Harorat, C°**	**Nisbiy namlik, %**	**Havo harakati tezligi, m/s**	**Karbonat angidrid, %**	**Ammiak, mg/m^3**	**Vodorod sulfid, mg/m^3**	**Yorug‘lik koeffitsienti**	**Sun’iy yoritish koeffitsienti**	**1m^2 maydonga, lyuks**	**Pol yuzasiga, lyuks**
Tug‘ruqxona	16	70	0,3-0,5	0,15-0,20	10	5	1/10-1/15	0,8	4,0-4,5	100-150
Bog‘lab va bo‘sh saqlanadigan 1 yoshdan katta qoramollar saqlanadigan xonalar	8-10	70	0,5-1,0	0,25	20	10	1/0-1/15	0,5	4,0-4,5	30-75

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Bog‘lamay (to‘shamali) saqlanadigan molxona	5-8	70	0,3-0,5	0,25	10	10	1/10-1/15	0,5	4,0-4,5	30-75
Profilaktoriya (20 kunlikkacha)	17-20	70	0,1-0,5	0,15-0,20	10	5	1/10-1/15	0,8	4,0-4,5	30-75
O‘sish yoshidagi buzoqlar (20 – 60 kunlik) xonasi	17-15	70-76	0,2-1,0	0,25	25	10	1/10-1/15	0,5-0,9	4,0-4,5	30-70
3 – 12 oylik buzoqlar xonasi	10	70-75	0,3-1,2	0,25	20	10	1/10-1/15	0,8	4,0-4,5	30-75

The amount of harmful gases (carbon dioxide, ammonia, hydrogen sulfide) is determined using special universal gas analyzers.
The operation of these devices is based on the principle that the indicator powder changes its color when exposed to gases.
In this process, the gas concentration is determined according to the length of the colored part of the indicator column using a scale.

Determining the lighting level in cattle barns.
There are three types of lighting: natural, artificial, and combined.
To determine the lighting level in barns, **phototechnical** and **geometric (indirect)** methods are used.

Using the phototechnical method, the **Natural Lighting Coefficient (NLC)** is determined.
The natural lighting coefficient represents the ratio between the illumination at a specific point inside the barn and the illumination on a horizontal surface outside the barn at the same time.

Using the geometric method, the **Lighting Coefficient (LC)** is determined.
The lighting coefficient shows the ratio between the window area and the floor area of the barn.

To measure natural, artificial, and outdoor lighting levels, **lux meters** are used.
Lux meters can be **visual** or **objective** types.
Currently, **Yu-16** and **Yu-116** models of lux meters are commonly used.

Conclusion

Proper organization of cattle housing conditions is one of the most important factors in achieving high productivity in livestock farming.
Analyses show that specific requirements are applied to animals depending on their **age, sex,** and **physiological condition**.

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It is necessary to strictly observe **ventilation systems**, **microclimate parameters** (temperature, humidity, air exchange), **lighting**, and **sanitary-hygienic rules**.
In addition, animals should be provided with **enough space for free movement**, as well as **constant access to clean water and nutritious feed**, which improves their health and productivity.

Keeping animals in unfavorable conditions not only reduces productivity but also leads to various diseases.
In general, maintaining **optimal housing conditions for cattle** serves as the main guarantee for increasing production efficiency, obtaining healthy offspring, and producing high-quality milk and meat products.

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