



## Review

# The environmental impact of the animal husbandry buildings (B)

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### Abstract

Microclimates parameters can be conducted by endowment with proper equipments and installations that inside space is to satisfy animal's biological needs, sometimes on economic ways. The aggressive environments from husbandry buildings react on building materials. The concrete is recommended to avoid cracking of concrete using the corrosion resistant iron like reinforcement. The brickwork - The non-corrodibility can be improved with petroleum impregnation, bitumen or tar coal, obtaining black bricks resistant to acids and bases. The wood - The fungi constituted the most dangerous wood degradation agents, as much through the rottenness effect as through attack quick extension. The fungi grow on wood in high humidity conditions from husbandry constructions.

*Keywords:* environment, animal husbandry, buildings

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The shelters protect the animals from adversely influence of the exterior environment, making an artificial space with parameters dictated by the animals. Microclimates parameters can be conducted by endowment with proper equipments and installations that inside space is to satisfy animal's biological needs, sometimes on economic ways.

To maintain an optimum climate, with profitable effects on health and productions, can be achieved placing correct technologies in a correct dimension space.

This climate must be closed with thermo non-conductive materials, on which aggressive agents can had a minimum influence.

In projection stage, through building solutions selected, we look to have pollutant materials on farms with minimum impact on environment. The animal's shelters the same like other buildings are systems with implications on the environment.

*The ammonia (NH<sub>3</sub>)* result from floors stagnated dejection decomposition resulted from animals.

The ammonia has bad activity on resistant and lock constructions elements, acting on pillars base, floors and walls. Big amounts of ammonia are emitted in ejection evacuating canals from waste platforms, tampon fosses and from dejection accumulation reservoirs.

*The hydrogen sulphide (H<sub>2</sub>S)* appears due to decomposition of organic substance from

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dejection. Is remarked, especially, the corrosive effect of sulphured hydrogen watery solution on concrete.

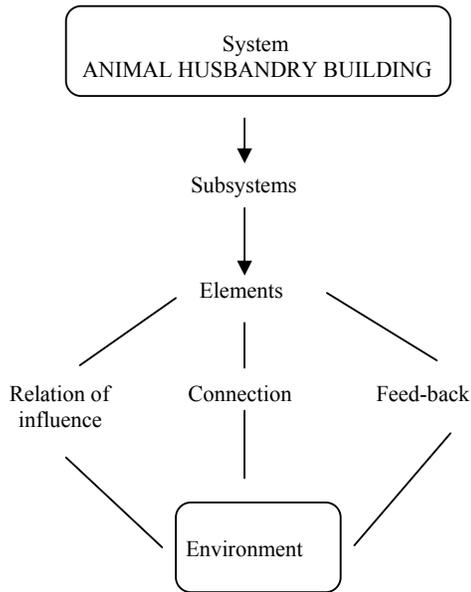


Figure 1. Relationship between animal husbandry buildings and enviro

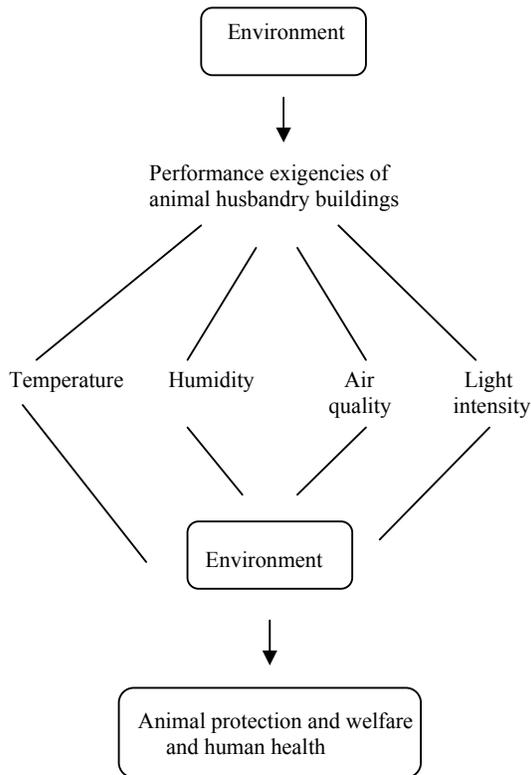


Figure 2. Relationship between environment, animal protection and human health

The fittings from concrete are corrosive, resulting iron sulphurs (FeS), especially in case on which the concrete was not compacted at pouring or the surface covered with concrete is too small.

In the buildings zone were the humidity is high, appear acids. Because of this reason the pH is followed. In husbandry constructions regularly inorganic weak acids (hydrogen sulphide) and organic acids (lactic, acetic acids) are resulted.

The lactic acid ( $CH_3 \cdot CHOH \cdot COOH$ ) is in degassed milk, sour milk, and pickled green forage. The lactic acid can appear on milking rooms floor, dairy shops, in picklets, in manger, on fodder alley if this is used like fodder table.

In silos, maturation of depositing mass is associated with organic acids formation (lactic, butyric, acetic acids in concentration of 0.5 - 1%), in the same time with temperature growth. In anaerobic fermentation situation, the temperature goes up to 30 - 50°C. In these condition acetic and butyric acids fermentation does not resist therefore result only lactic acid. The lactic acid corrosion is proportional with acidity degree being significant for pH < 5.

The fodder pickled aggressively rise when is added sugar and molasses. The action on concrete is significant.

In dejection evacuating sewer in fosses and depositing platforms chlorine ions and chloride appear in water which leaching in dejection mass.

Alkaline substances characterized by pH > 7 are in animals shelters, in dairies, veterinary spaces like a result of the disinfected substances and hygienic solutions used.

In almost all husbandry constructions the relative humidity is too high, having frequent value of 85%. If the animals are living in a humid environment, they are sensitive to lower temperatures. In the presence of air flow the animal feel cold if the air speed is high.

High speed of air flow put especially young animals to fight with cold with negative results on health (the body resistance go down). As much humidity is bigger, as cold is piercing and harder to support.

Water vapours condensation on lock surfaces, penetrated into inside of them, phenomena which in time force to degradation.

**The aggressive environments from husbandry buildings react on building materials.**

**THE CONCRETE.** From combination between the ammonia ( $NH_3$ ) and water result ammonia hydroxide [ $NH_4(OH)_2$ ] which had a basic reaction. Ammonia hydroxide is impure with diverse ammonia salts which react with

calcium hydroxide  $[Ca(OH)_2]$  resulting soluble calcium salts which levigate leave holes in concrete structure.

The corrosion phenomenon is often meted to the concretes with reduced cement contents.

The chlorides and chlorine in big concentrations tend to levigate the calcium lime from concrete. Magnesium chloride and aluminium ( $MgCl_2$  and  $AlCl_3$ ) in concentrate solutions react with calcium lime resulting unstable and water-soluble compounds. To content over 1000 mg chlorine/litre appear reinforcement corrosion danger from concrete.

Calcium chloride attack the reinforcement from concrete if the concrete is not covered well or is not compacted.

The lactic acid is corrosive agent on cement stone through calcium lactate formation (a substance very soluble).

The protect measures used are depending on his concentration. Thus is using:

- dense concretes, with a low content of kemidol;
- compact concrete with big ratios of cement (at silos) across is applied treatments with creeps or paints on bituminous base;
- stoneware floors or mosaic plates treated with silicon fluorides, jointed plates with cement mortar treat with sodium silicate.

Alkaline substances act on concrete through exchangeable directly reactions, with mineralogical components of cement stone or through basses carbonation with big concentrations which penetrates into concrete pores and destroy it by expansively salts accumulation.

Through utilization of quartz units with at least 300  $Kg/m^3$  cement additions in composition, the protection of concrete is realizable.

If aggressive medium produce concrete corrosion it means is not the same for the enforcement.

The enforcement corrosion is produced when the concrete is solid and the pH is 10 - 11. The corrosion can be produced and by cork accelerations.

Is recommended to avoid cracking of concrete using the corrosion resistant iron like reinforcement.

To the sterilized and reinforced cellular concrete, the reinforcement is much more in an exposed degradation position. This fact is because of concrete porosity, alkalinity and preparation way.

For protection the followings are used:

- rubber latexes with cement and ammonium caseins additions layers (this method is rare used because of reduced efficiency)
- bitumen and cement films, warm applied bituminous suspensions.

**THE BRICKWORK.** Brickwork properties are dependent of clay mineralogical components and burning point.

Brickwork corrosion in basic medium (sodium hydroxide 10%) is pronounced. The phenomena's is manifested by mechanical resistance.

The non-corrodibility can be improved with petroleum impregnation, bitumen or tar coal, obtaining black bricks resistant to acids and bases.

**THE WOOD.** The fungi constituted the most dangerous wood degradation agents, as much through the rottenness effect as through attack quick extension. The fungi grow on wood in high humidity conditions from husbandry constructions.

The wood suffers more fungi attacks types:

- destroying, by brown rot, which cause the change of color from reddish toward dark gray brown, in final producing wood smash in prismatic nubs;
- the white rot, or corrosion rot, produce the bleach of the wood and unbind longitudinal of fibres;
- the alveolar rot, destroys certain zones, producing indents;
- the mucilaginous rot appears in humid environment producing wood delamination (the wood has grey or brown color, in humid condition is soft and to drying delaminate)

Factors such as temperature and humidity conduct to insects' development (coleopters, xilophagous), which attacks the wood.

Are a lot of chemical or constructive measures to protect the wood, as:

- preventives chemical treatments;
- using oily, soluble substances, organic solvents, inorganic substances with Cr, Cu, F, Bo.
- painting with sodium silicate, milk of lime or clay watery suspensions;
- building with plaster on wire;
- building with gyps on wire;
- the execution of protection brick-layers from bricks, veneering with table, etc

**METALS.** The corrosion of the metals on husbandry buildings is a frequent phenomenon, demonstrated through the surfaces destruction in high humidity conditions. The corrosion can be chemical or electrochemical.

The join zones of pieces are sensitive to corrosion,. The high relative humidity and carbon dioxide create of metals corrosion favourably conditions. The metals protection can be done with constructive measures or using protections materials.

Is avoided the humid mediums (water stagnation) is using primers with less lead and linseed oil with chrome-plated zinc, or synthetically resins. The primer is covered with lakes or paints, with protective roles.

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